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ORIGINAL ARTICLES

THE SELECTION OF APPLIANCES IN THE TREATMENT OF MALOCCLUSION*

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WHEN your Board of Censors asked me to read a paper at this meeting, upon the subject of selection of appliances for treatment of orthodontic cases, I was torn between two desires, my own desire to refuse and my duty to the society. As I reflected upon this subject, I realized that while a member of the Board of Censors, I had asked the senior members of the present board for papers and they had not refused. Therefore, I considered it a duty to comply with their request. Consequently, I hope you will be charitable to this humble effort.

I am fully mindful of the fact that there are differences of opinion among us regarding the treatment of orthodontic cases. There are many who use one type of appliance in preference to any other, while there are many who use that type of appliance which they think will bring about the best results in the shortest possible time justifiable with known physiologic laws.

Many of the men who prefer to use but one type of appliance, at the exclusion of all others, try to justify their selection by claiming that the particular appliance in question is the only method of producing physiologic bone growth, and base their contention by quoting theories advanced by some authority in a collateral science, which is entirely irrelevant to the subject at hand.

Then again, there are men who use another type of appliance at the exclusion of all others, because their particular appliance has been proved by histologic evidence to be responsible for bone growth. These men contend

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such evidence has never been shown as being produced by any other kind of appliance, and they are partially correct in their contention. Like most appliances this particular one has its limitations, but even with its limitations it is preferable to any other for certain purposes.

I hold no brief for any appliance, or for the maker of any, neither is this statement to be considered as a concealed thrust at any one of the appliances used today, or at the originator of any type of appliance, for the continued use of any appliance justifies its existence. But as we are dealing with a scientific subject, which of necessity must be founded upon truth, we must accept only those statements which can or have been proved and not accept fictions (though honestly given), in the place of facts.

We are apt to condemn an appliance because of its limitations as is shown by a recent article on the limitations of the lingual arch appliance. But I am sure that no man knows any more of the limitations of this appliance than does Dr. John V. Mershon, as is evidenced by the following which I quote from a paper read by him in San Francisco, February 17, 1920, and published in the *Dental Cosmos* of June, 1920.

"Our problem is one of development, it is a study of growth and the functional forces of growth which control development.

"The teeth and their occlusion are an incident thereto. We are treating impaired function which results in defective development, and we are erroneously endeavoring to do it artificially with a mechanical appliance."

In recommending the removable lingual arch for this purpose, it is not to be considered a universal appliance. It is at times used in connection with the labial arch, especially in Class II and Class III cases. The making and using of the lingual arch appliance are most difficult, but it is a most efficient appliance if properly used. With the lingual arch and the auxiliary springs, we can apply a pressure to a tooth which approaches the normal growth force as closely as it is humanly possible to judge, so that we can produce development and tooth movement without destroying the harmony of function between the tooth and its supporting tissues.

In selecting an appliance for the correction of malocclusion of the teeth, I do not care about its limitations. What I want to know is if the appliance will do what I want it to do absolutely in conformity with known physiologic laws, easier and better than any other appliance or combination of appliances.

I believe in the use but not in the abuse of any type of orthodontic appliance which will deliver gentle, yet constant force in the desired direction upon malposed teeth, thereby creating cell activity, in conformity with known physiologic laws, causing teeth to move into the line of occlusion, and thereby assume their correct position and function with as little interference as possible with the known factors, that act as the forces of occlusion and those factors which tend to preserve the integrity of the dental arches.

There have been too many champions of certain types of appliances in the past, each claiming and believing special merit in that particular appliance above all others, whether on account of superior mechanical claims or in the end-results as evidenced by what they believe to be normal physio-

logic bone growth. But when you ask these people to qualify such a statement regarding physiologic bone growth, they are at a loss to explain what they mean.

It has been claimed by some that the only evidence of physiologically grown bone was produced by Oppenheim and that all these movements were produced by inclined tooth movement, and not by the bodily movement of teeth. This, however, may or may not be true, but the fact remains that those who continue to move teeth by the labial alignment wire are compelled at some time or other to resort to some mechanical device to tip the apex of a tooth buccally or labially, and this procedure does not seem to cause them a great deal of anxiety, as to their ultimate result, or whether the tissue changes were produced physiologically or otherwise, as long as tooth movement has been produced slowly.

The experiments of Oppenheim have proved we should use a gentle and continuous spring force in preference to the unelastic force on account of the subtle reactive ability of the bone to external influences, and that we should be guarded in our movements by the firmness of the teeth in their sockets, but I cannot find where he or any one else has ever proved that where care is exercised that bodily movement of the teeth is to be condemned, although I will admit that teeth are more firm in their sockets when moved by inclination than when moved bodily. This is obvious when you examine the evidence submitted by Oppenheim. Where inclined movement is used there is a response to the stimulus in only about two-thirds of the bone surrounding the root of the tooth. At the apical area Oppenheim found but little change. Therefore, since there is no entire bony reconstruction around the entire root, the moving tooth necessarily remains more firm when moved by inclination than if bodily movement of the tooth had been accomplished. But even this does not condemn bodily movement.

Tissue changes must be either normal or abnormal. Normal changes are physiologic changes. According to Adami, "In the long bones for instance, there are constant changes taking place to strengthen spots of increased stress."

Repair of bone injured by trauma is a physiologic process, and while the structure at the point of repair at first differs histologically from the mature bone, it sooner or later becomes indistinguishable.

Therefore, I consider the only pathologic changes which take place in the movement of teeth whether moved by inclined or bodily movement, are those produced by the osteoclasts in advance of the moving tooth, and those produced by hemorrhage and other trauma in the wake of the advancing tooth generally caused by the too rapid tooth movement and too severe pressure.

The moving of a tooth is not a physiologic process like a normal development, which is one that follows the plane and movement of a tooth during the process of eruption; no tooth, during its normal eruption, moves in the same way, as does a tooth that is moved by orthodontic pressure, because the latter is artificially induced, but the reparative process and bone growth subsequent to tooth movement certainly are physiologic, whether induced by

inclined or bodily movement of the teeth, for this is evidenced by our end-results when a satisfactory completion of the case is attained.

Therefore, I believe that bodily movement of teeth is not to be condemned, although I prefer to use an inclined movement if I can get the desired result by the latter manner, but I will continue to use bodily movement appliances until it is definitely proved that they are detrimental, and as far as I know such evidence has never been produced when slow and careful tooth movement has been accomplished.

Dentofacial deformities constitute a group of abnormalities that arise as a result of some previous disorders and may be regarded as consequences of malocclusion of the teeth and malposition of the dental arches.

Hence a thorough understanding of orthodontic diagnosis is essential before the selection of any kind or type of regulating appliance is made for the correction of any case of malocclusion.

Diagnosis may be defined as the art of discriminating between diseases or deformities and distinguishing them by their characteristic signs and symptoms. It implies a consideration of such general conditions as age and health of the patient, the relative degree of growth and development and a recognition of the causative factors. According to Lischer, "An orthodontic diagnosis may be said to embrace the determination of the particular type of malocclusion, the degree of facial deformity associated therewith, and the recognition of such other abnormalities as may complicate the same, or stand in causal relation thereto."

But this does not necessarily imply we must have a thorough understanding of every etiologic factor, which is contributory to a given case of malocclusion, for there are undoubtedly many contributing causes which are but little understood and yet we have restored proper function to the dental apparatus, to certain organs of respiration, and we have restored facial contours in spite of our limited knowledge of all those biologic factors which were primarily responsible for the malposition of the teeth, the malrelation of the arches, malformation of the jaws, and malposition of the mandible. A better knowledge of these etiologic factors is desirable in order to eliminate if possible any tendency toward a return to the former condition of the dental apparatus, the facial deformity and impaired function which generally are the sequelae of a severe case of malocclusion.

I have touched upon the necessity for a thorough understanding of orthodontic diagnosis, and a better knowledge of the etiologic factors of malocclusion although it is not in the subject assigned to me. My reason for doing this is primarily for the purpose of emphasizing the fact that we cannot blame the mechanical principles of an appliance for its failures, neither can we credit those principles with the entire success in any given case of orthodontia, because the skill of the operator in his diagnosis is a most important factor, his technical ability is another, and the general health and cooperation of the patient are of no small importance.

We have listened far too long and far too intently to these orthodontic authorities, rather than to the call of scientific evidence; we have taken too many statements from these authorities as though they came from a court

of last appeal, only to find that their statements are subject to change after scientific investigation. I do not think we will ever arrive at finality in orthodontic appliances or treatment, for our failures of today may be our successes of tomorrow. When scientific investigation reveals the truth and progress brings the required methods, then I believe we will climb to pinnacles we previously thought were unsurmountable.

It is useless of us to spend the time to discuss the mechanics in orthodontia, as this has been so beautifully presented to us by Hellman in a paper on, "Mechanics in Orthodontia from a Modern Aspect," in which he has coined the term "biomechanics," and so ably stated his reasons for so doing. But I would call your attention to some of his conclusions, namely:

1. That orthodontia as a whole can under no circumstances be regarded as a problem in mechanics alone.
2. That the processes involved in the natural movement of the teeth are intimately associated with inherent tendencies of the teeth and their supporting environment.
3. That the tissues involved in orthodontic procedure do respond to mechanical forces, but not in accordance with physical laws.
4. That the teeth are moved artificially by processes of a biomechanical nature.
5. That the construction of orthodontic appliances constitutes the only mechanical process in orthodontia and requires no extraordinary skill nor special engineering or mathematical training.
6. That the manipulation of orthodontic devices in the treatment of malocclusion of the teeth is an art and that it is of considerable advantage to be endowed with special artistic talents besides mechanical skill in order to excel.

We have listened to and read about these ideal appliances, which are the producers of physiologically grown bone. We have also heard the condemnation of other types of appliances as being tooth tippers (*par excellence*), but here I affirm that no appliance is a tooth tipper, (*par excellence* or *per se*). Only faulty manipulation or carelessness or both on the part of the operator may cause any such undesirable tooth movement as is depicted by some of the champions of certain types of appliances.

After a careful diagnosis has been made and we are satisfied as to the nature of the abnormality to be corrected, we should next consider the condition which we wish to establish, which some of us call "Normal Occlusion," and others the "Angle Hypothesis." Neither term is acceptable to me because I do not believe we can find the former, and the latter seems to me to assume more than the evidence justifies. But in spite of this I am sure your concept of this ideal condition and my concept of it are so nearly alike that we would be unanimously of the opinion that this so-called norm is nevertheless a necessary, useful and indispensable fiction and we will continue to consider it as our goal in orthodontic procedure for the present time.

We should next consider what movements are necessary to produce this vital response to our applied mechanical force in order to bring about the desirable condition we wish to establish and what method will best accom-

plish these movements. "Now here is the rub": If mechanics were the only consideration involved in the selection of orthodontic appliances there would be no question regarding the choice of appliance in any case, but as this is in no circumstance a problem of mechanics alone but a biomechanical consideration we must treat it as such and consider the qualifications of the orthodontic appliances at our command.

First we can divide the requirements of an orthodontic appliance into three requisites, namely:

- I. The physiologic requirements.
- II. The mechanical requirements.
- III. The esthetic requirements.

I. THE PHYSIOLOGIC REQUIREMENTS

1. Appliances must stimulate growth biomechanically.
2. They must work within physiologic limits, in other words, they must not overstimulate through undue pressure or this vital process will be interfered with, and progress thereby will be retarded.
3. They must produce this gentle force only in the direction of desired growth.
4. They should not interfere with mastication or speech.
5. They should not interfere with prophylactic procedure.
6. They should be made of noncorrosive metals, which will not pour into the system solutions of metallic salts which may be injurious to the physical well-being of the patient.
7. They should not be of sufficient size or bulk that may interfere with the function of any other organ.

II. MECHANICAL REQUIREMENTS

1. Appliances must have perfect control of force.
2. They should have staple attachments.
3. They should be constructed of highly elastic metals, which can be hardened and tempered within the required limits in order to produce gentle yet constant force over a definite amount of space.
4. They should be constructed of high fusing metal or alloy in order to use high grade solder for their attachments which will not be so liable to alloy these attachments and render their elasticity ineffective (yet the solder used should not be of such a high grade that would require sufficient heat to flow the same, which may destroy the desired physical properties of the elastic alloy used in the construction of the appliances).

III. ESTHETIC REQUIREMENTS

1. Inconspicuousness.
2. Delicacy of construction.
3. Use of noncontrasting metals.

By considering these requisites I think that you will agree with me that an ideal appliance should be one which would be physiologically and mechanically perfect, and at the same time be invisible, but like most things ideal it exists only in the imagination, and not in reality.

Therefore we must select an appliance for any given case that is as near the ideal as we can conceive. It must possess the necessary qualities of efficiency within the known physiologic necessities without being too conspicuous.

The term "anchorage" in orthodontic cases is very misleading. According to Hellman, "Anchorage in its true sense does not exist in orthodontia." There is no point in the mouth to which an appliance may be attached that can resist force without being affected by it.

The force necessary for inducing cell changes in the tissues constituting the alveolar process is so small that no device, however cleverly conceived or no combination of attachments, however skillfully executed, will succeed in avoiding it, but I am sure you can stabilize this so-called anchorage to a considerable degree by auxiliary attachments, and so minimize the stress and strain which would unquestionably raise havoc without such stabilizing influence.

But on the other hand such entire stabilization is not essential, for in the vast majority of cases we are called upon to move these so-called anchor teeth in various directions and it is for us to consider and devise ways and means that we may always have them in complete control.

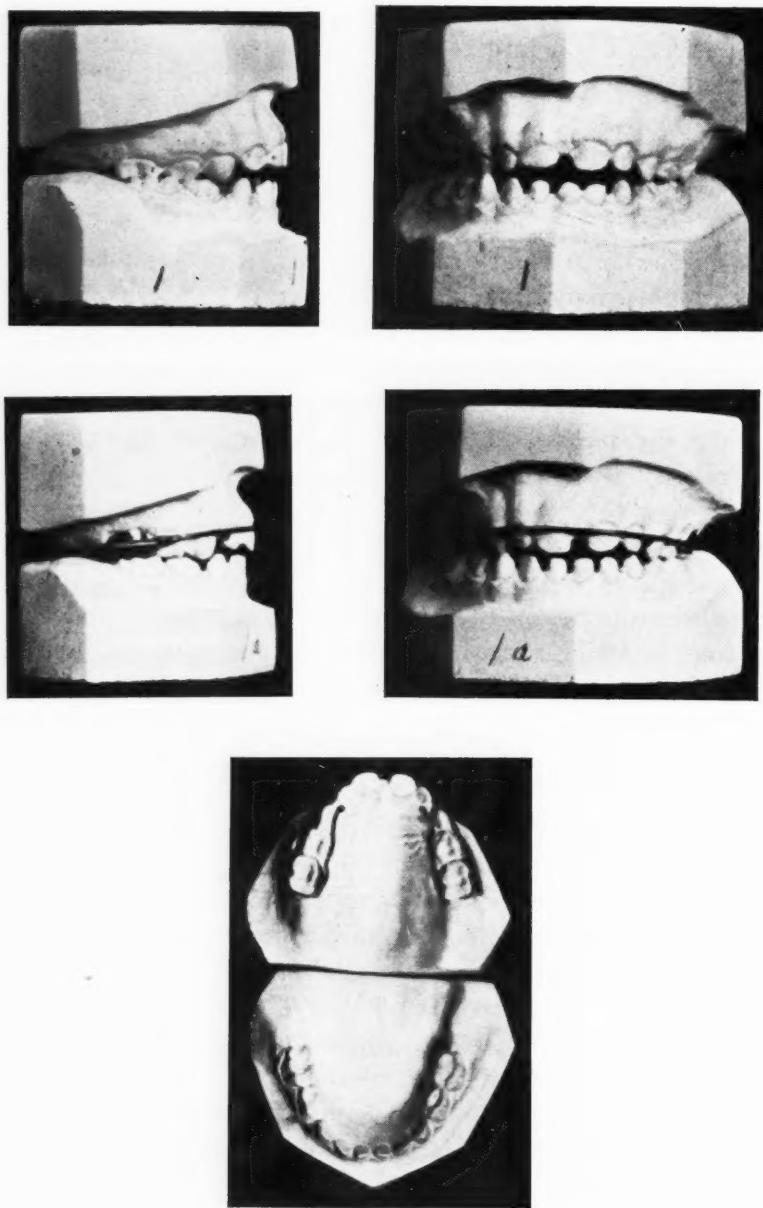
In endeavoring to present this subject in a more practical way, I have selected eighteen successfully treated cases, and have made a facsimile of the appliances used in the treatment of each case, in order that we may have a free and impartial discussion of them. I want it strictly understood that I make no claims of originality in any of these appliances, nor do I claim their superiority over any other type of appliance for any given purpose. I only present these as my choice and state the reason for my preference, acknowledging that the same results may be obtained by some other man using another kind of appliance, but if I had such cases to treat again, I would choose the same appliances, with possibly one exception.

This paper deals with the selection of orthodontic appliances only, but I have been forced to inject some diagnosis into my paper for the sole purpose of showing that the selection of appliances is contingent upon diagnosis.

I have avoided stating all of my diagnosis in any of the following cases, primarily to limit the discussion to appliances, and secondly because I am only presenting successfully treated cases (although I have a few of the others I could present), and the end-results have justified the means of accomplishment excepting the last case which is under treatment at the present time, and which I have every reason to believe will become a satisfactory result to all concerned.

Case 1.—Miss M. D., aged six. There seemed to be a normal development going on, except the right maxillary lateral canine, first and second molars were in lingual version. In order to bring about an ideal condition, it was necessary to move these teeth buccally or facially. Therefore I constructed the appliance seen in Fig. 1 *a*, using an oval buccal tube to stabilize my anchorage on the left upper second molar; I augmented this with a lingual extension as far anterior as the canine, connecting the extension to the labial arch with a ligature and thus increasing the anchorage. On the right molar

I used a round buccal tube which allowed buccolingual tipping of the anchor tooth, which moves easier than if moved bodily. When the second molar was in its correct position, I then ligated the first molar to the labial alignment wire, then the canine and lateral.



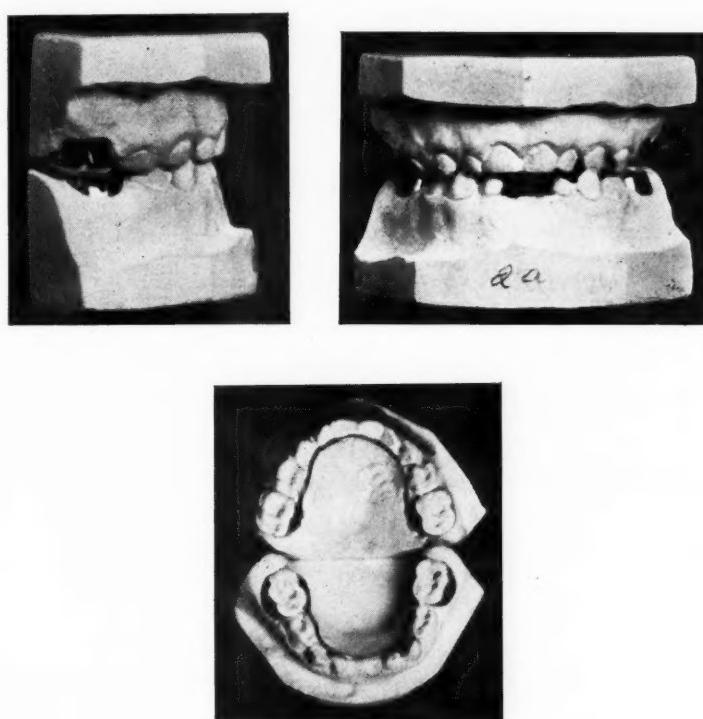
Case 1.

After all teeth had been moved into their desired position, I bent the right lingual extension until it came into contact with the teeth which had been moved, and passed a ligature from the extensions to the labial wire.

The small rings were to prevent the ligatures from sliding forward on the alignment wire, no retention was necessary, and no later treatment was needed.

Case 2.—Miss M. W., aged six years. In this case there was a general lack of development in both mandibular and maxillary arches. I decided upon general expansion and selected the removable lingual arch to accomplish this result, using two auxiliary springs from canine to canine; the springs were held to their position by a spur between the centrals on the upper, and between the central and lateral on the lower.

When the development had been completed I constructed a new lingual arch and adapted it to the new position so that no further auxiliary springs were necessary. The permanent dentition is now complete and everything seems about as ideal as possible.



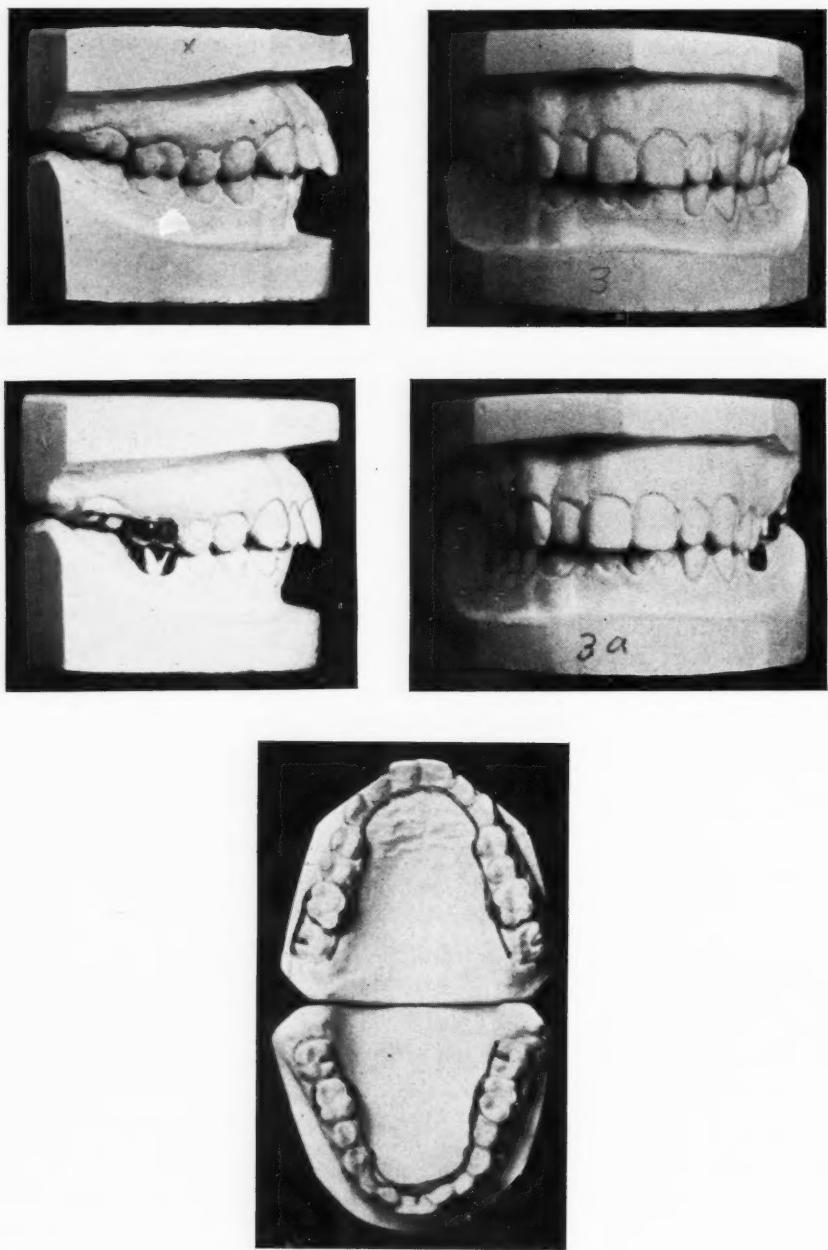
Case 2.

Case 3.—Master G. W., aged fifteen years, presented a neutroclusion case, with an exaggerated curve of Spee. The combined width of the central, lateral, and canine measured ninety-eight one hundredths of an inch, and the arch form correspond very closely to the Hawley arch form, being slightly narrower in the premolar area, and a little longer anteroposteriorly. This ease did not require much expansion of the dental arches, and there were only slight rotations to be made in the mandibular anterior teeth.

Therefore, I selected a removable lingual appliance, carrying extensions posteriorly to prevent the distal tipping of the first molars, when a downward pressure was applied to the anterior teeth in changing the curve of Spee. Auxiliary springs were used on the mandibular anterior teeth to bring them into proper alignment and finally I had to resort to a labial wire on the lower to finish my rotations, the maxillary being finished with the original

appliance. After active treatment was accomplished, the lingual lower was then stripped of the auxiliary springs, and realigned for retention.

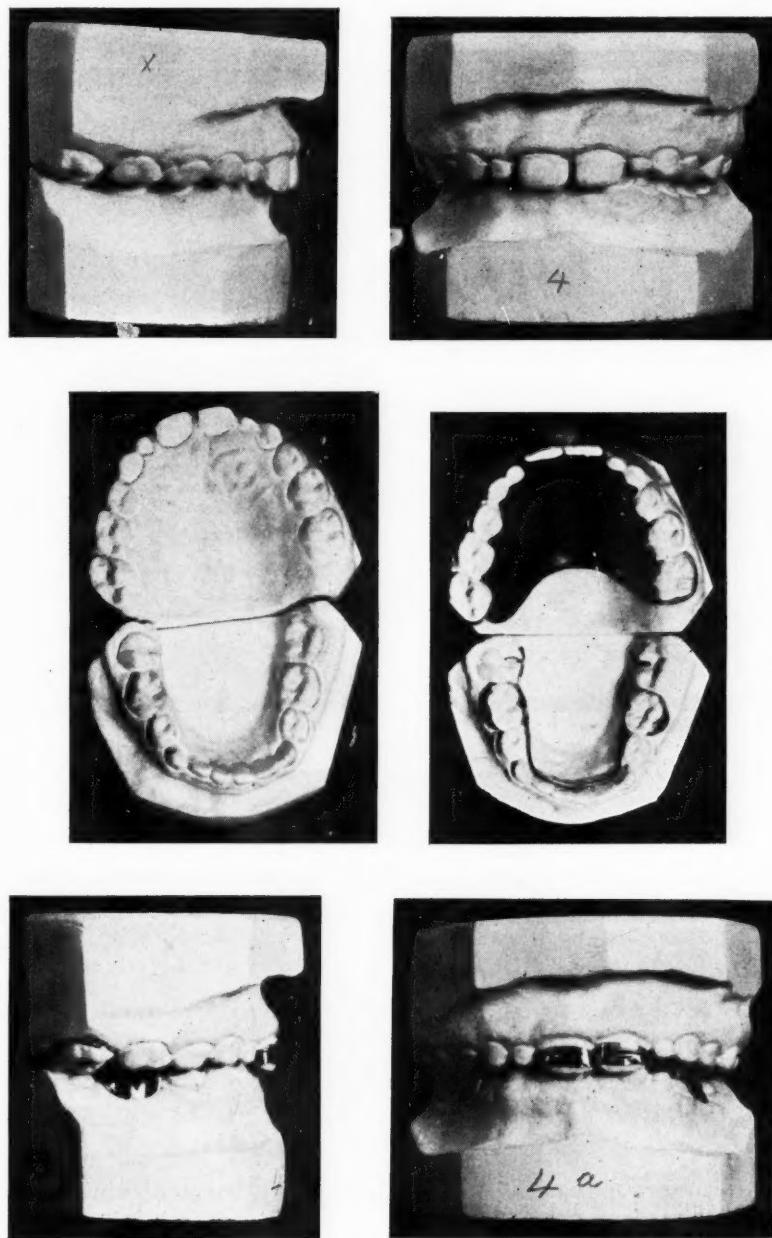
I have seen this case recently and the lower lingual appliance is still in the mouth, although I believe a removable Hawley retainer should be worn occasionally, instead of the lingual appliance.



Case 3.

Case 4.—Master Wm. A., aged nine years. This case presents a neutroclusion case with an apparently overdeveloped maxilla and a constricted mandibular arch caused by all the mandibular teeth biting lingual to the maxillary teeth when in occlusion.

In order to establish a perfect occlusion it would be necessary to expand the mandibular arch and this could not be done without further enlarging the maxillary arch unless we used some form of a bite plane to open the bite, which was accomplished in the following manner. The centrals were

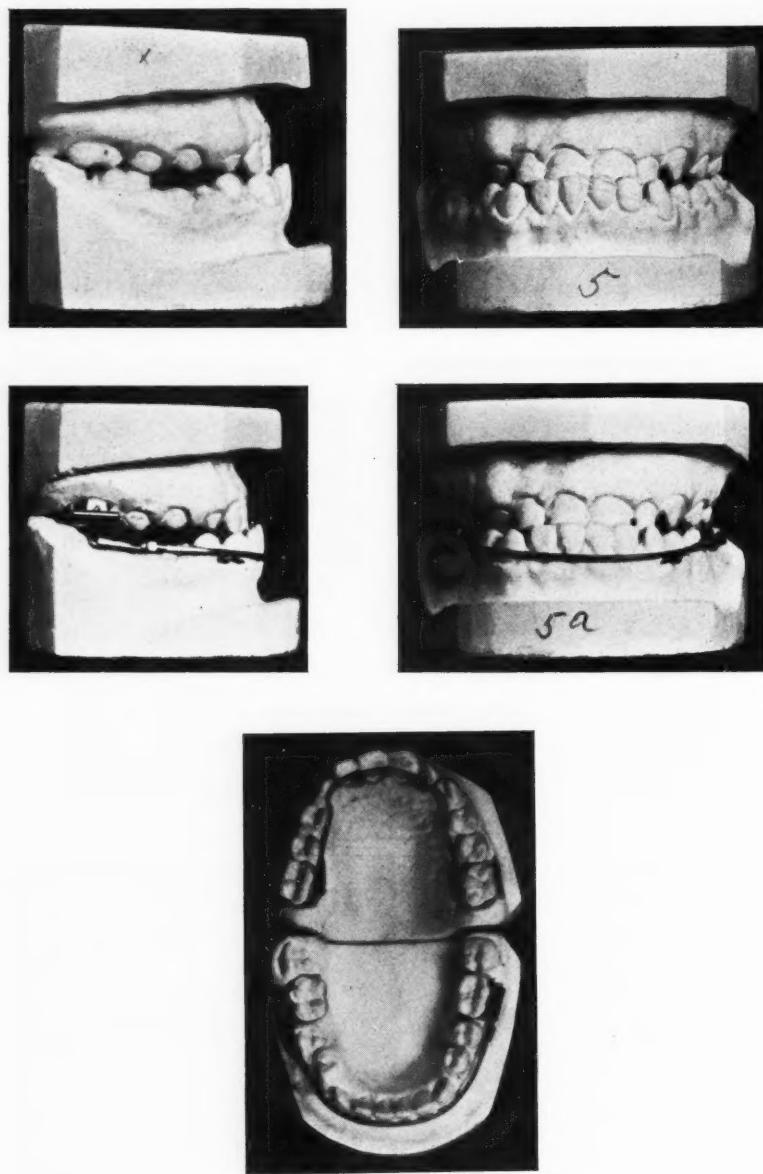


Case 4.

banded and small lugs were soldered to them; a bite plate with a bite plane was constructed which opened the bite sufficiently to allow the mandibular teeth to be moved buccally, by a lingual removable alignment wire. The mandibular anterior teeth lay upon the arc of a circle as depicted by Hawley's mandibular arch form 84 which is equivalent to a maxillary 98 arch form. The

maxillary centrals measured thirty-seven one hundredths inches and the first molars measured forty-two one hundredths inches.

I do not wish to be misunderstood as recommending the Hawley arch form as being infallible, but thanks to Simon's idea I find it a very useful and almost indispensable fiction, in anticipating the approximate arch form,



Case 5.

and strange as it may seem these arches when equalized, corresponded exactly to the Hawley arch form.

When the mandibular arch had been widened sufficiently I removed the bite plate, but continued the removable appliance on the mandibular teeth for some time, as this was used for active treatment and as a maintenance appliance.

Case 5.—Miss M. T., aged twelve years. This case presents almost a normal arch form in the maxilla as well as the mandible. I do not consider this as a mesioclusion because the patient could almost make the incisors meet edge to edge, and when in such a condition the mesiobuccal cusps of the maxillary first molars were directly over the buccal groove of the mandibular first molars.

I constructed a removable lingual arch with an auxiliary spring on the maxillary teeth and attached buccal tubes on the molars in case I should have to use the labial alignment wire but this I did not have to do.

On the mandibular teeth I constructed a labial alignment wire with oval buccal tubes on the molar bands and hooks for the use of heavy silk ligatures running from the distal of the mandibular molars to the hooks on the alignment wire of the mandibular arch in the canine region.

In this case I retracted the mandibular incisors and moved the maxillary incisors forward as soon as an overbite was established. I removed all appliances, no maintenance appliance was necessary. I have recently seen the case and I think I have never seen a more beautiful result.

Case 6.—Miss D. P., aged sixteen, presents a neutroclusion case with the right maxillary first molar, first and second premolar, canine, lateral and central incisor teeth in linguoversion, and with a general crowded condition of all the maxillary teeth.

The combined width of one central, one lateral, and one canine tooth measured ninety-six one-hundredths of an inch, and such a Hawley chart would indicate that a great deal of expansion was necessary.

The Pont index showed the maxillary arch in the region of the first premolar needed to be expanded about 10 mm., while the first molar region needed to be widened only about 8 mm.

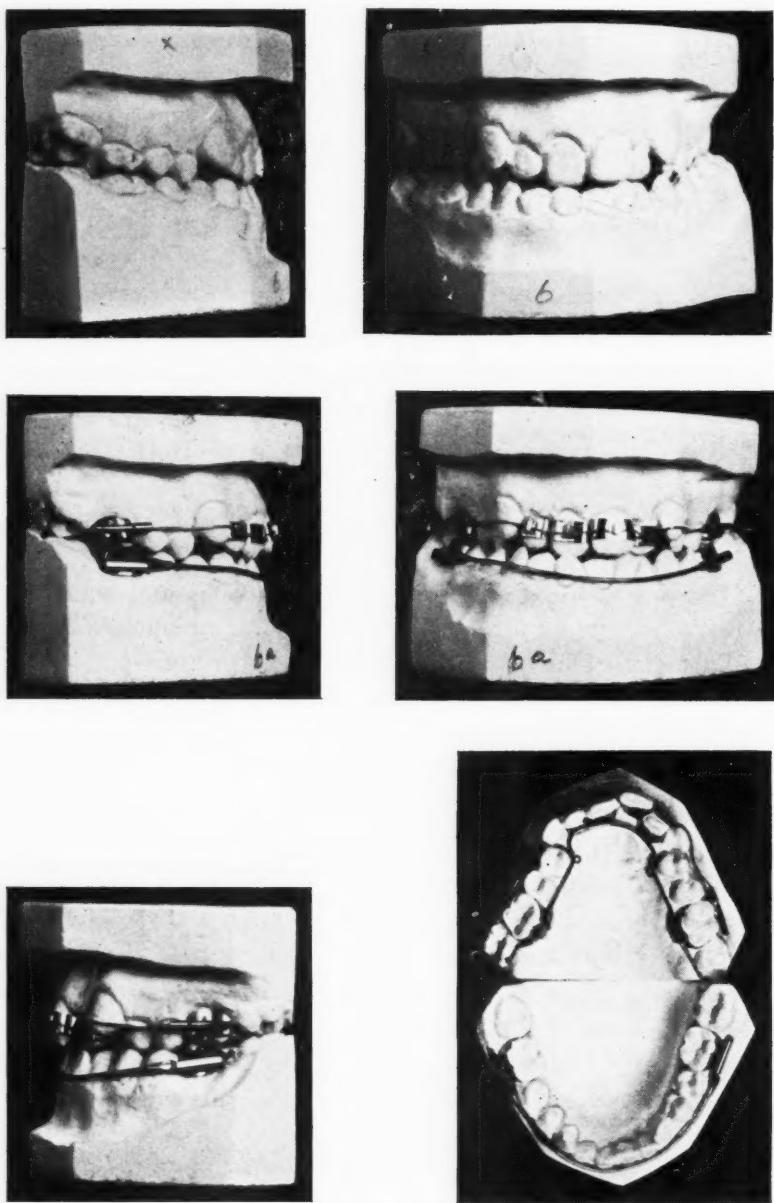
The corresponding Hawley chart for the mandibular teeth was about eighty-four one-hundredths of an inch in size, and showed the mandibular molar teeth to be in about their normal position, except that all the crowns of the anterior teeth inclined lingually. I considered these should be tipped labially, hence the labial alignment wire with ligatures was preferred.

On the maxillary teeth I constructed two plain bands on the first molars, with curved sheaths on the buccal surface of the same, and a removable lingual alignment wire fastened by a specially constructed lock. Two auxiliary springs were attached to either side of the lingual alignment wire as shown in Fig. 6, occlusal view.

The four incisors were banded with Angle bracket bands, and a plain wire of .018 gold platinum alloy (No. 4 Aderer) was placed into the curved sheaths and the center portion of the wire was sprung into the bracket bands and locked in with the Angle lock pins.

You will remember that the brackets are constructed for the reception of a flat ribbon which measures .022 thousandths of an inch and .036 thousandths of an inch. The plain round wire being but .018 thousandths of an inch will permit of rotation within the bracket bands, thus moving the incisor teeth and rotating them.

Later, two ribbon arch ends were soldered to a piece of .020 thousandths round wire replacing the plain .018 thousandths wire to move the incisors forward. You will notice all tooth movement thus far was accomplished by an inclined movement.



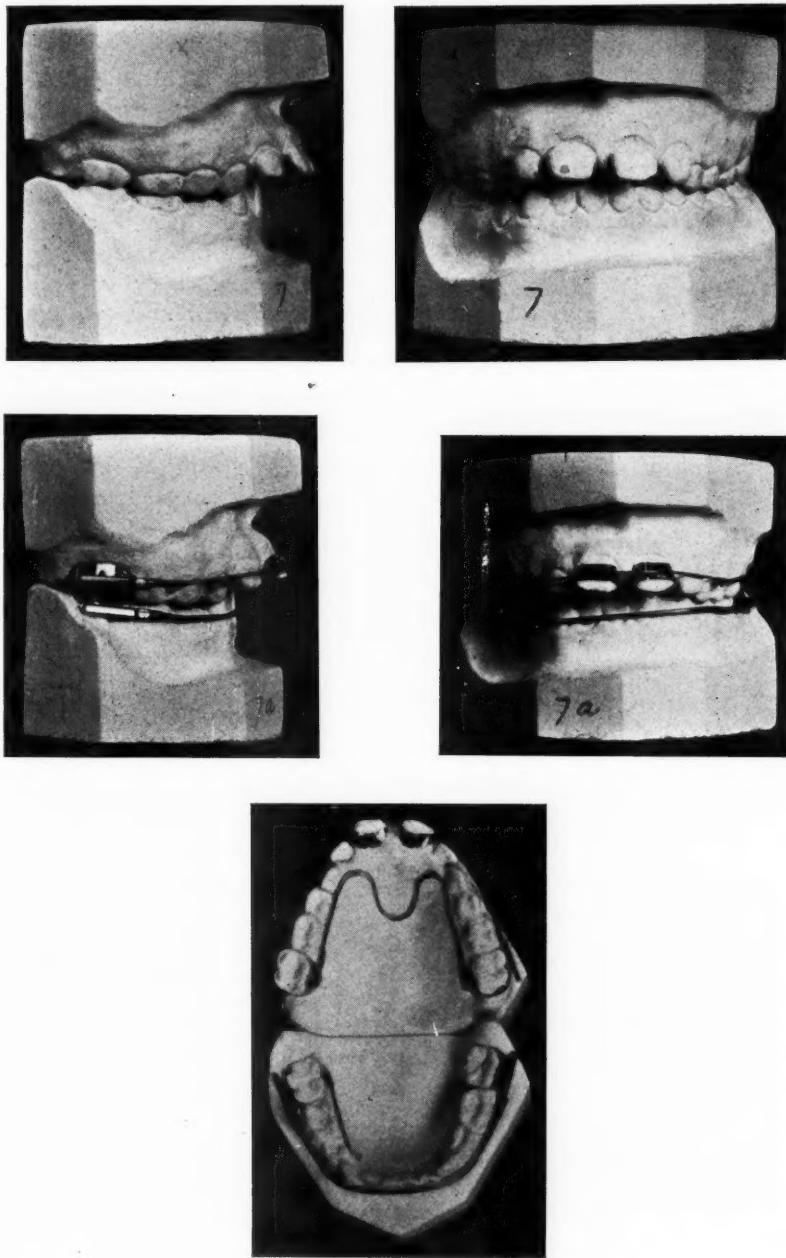
Case 6.

After arch form had been established by the lingual alignment wire with auxiliary spring moving the molars and premolars buccally and the incisors and canines moved by the labial alignment wire within the bracket bands.

A ribbon arch was substituted to tilt the roots of the incisors into the

respective position. In this manner I have avoided any extensive bodily movement of the teeth, and the end-results have justified this selection.

Case 7.—Miss M. G., aged nine and a half, presented a neutroclusion case accompanied by labioversion of the central and lateral incisors caused by a



Case 7.

pernicious lip habit, which had developed a very large lower lip and had forced the mandibular incisors into linguoversion, but had not disturbed the normal anteroposterior relation of the molar teeth.

I banded the maxillary first molars with plain bands and stabilized these

with a lingual alignment wire which came in contact with the deciduous molars and canine. I then tempered the lingual wire very stiff and placed it in the mouth in a passive condition, because the Pont index registered 30, which gave the width of the first premolar as 37.5 mm., and the first permanent molars as 46.87 mm., and the width of the arch in these respective areas measured exactly these distances. Hence my energies were confined to the anterior teeth of both mandible and maxilla.

I banded the centrals with bracket bands and with a round .020 wire with hooks soldered to the same in the canine region. I retracted the anterior teeth using medium silk ligatures until the anterior teeth were in proper alignment.

I then banded the lateral teeth and substituted a ribbon arch for the round wire, and in this manner I changed the angle of inclination of the maxillary incisors.

On the mandibular teeth I elected to use a labial alignment wire, and stabilized my anchorage with two lingual extensions from the molars; for here a lingual alignment wire was contraindicated, because it would inhibit the pushing action of the tongue which I think is most desirable in these cases, and the labial alignment wire helped to counteract the action of the lower lip on the mandibular incisors, which were later brought into proper alignment. But the lip habit continued and finally, in desperation, I soldered two small pricking spurs on the upper central bands above the point of occlusal contact, their sharp points sloping downward. This immediately stopped the lip habit.

Case 8.—Miss L. H., aged thirteen, presented a mutilated case in which I am free to confess I did not know, neither did I care anything about its classification.

When the case came into my practice, there had been a recent extraction of the first maxillary molars while the first mandibular molars had been extracted two years previously.

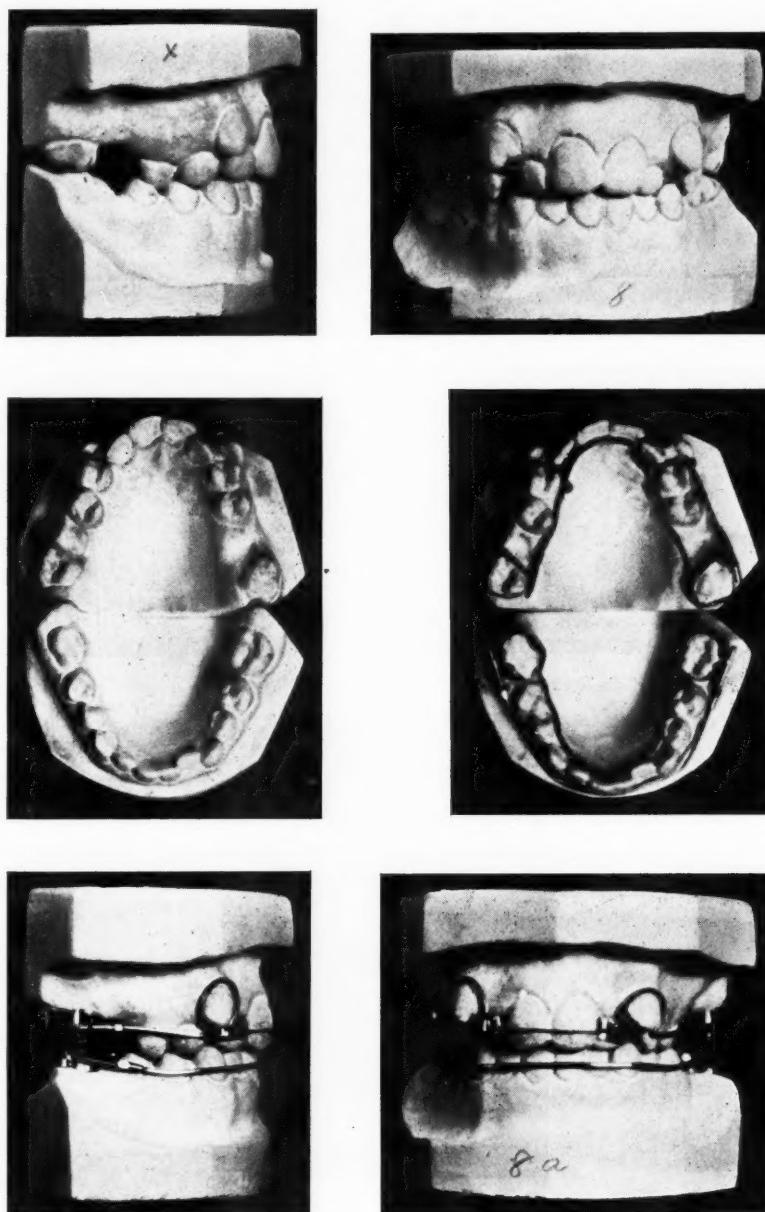
Despite this maloclusion the young lady had one of the handsomest face forms that I have had the pleasure to look upon. I decided to treat this case by moving the maxillary premolars distally, the laterals and centrals labially, and allowing the canines to erupt in their position, which I did by selecting the following appliance as my choice. Plain bands were constructed for the maxillary molars and a removable lingual wire was attached with a latch lock to stabilize the anchorage and for use as a base for the auxiliary springs in moving the premolars distally.

A flat ribbon arch was cut and round loops were made over the canines and soldered to the flat ribbon arch; on the other end of the loop was soldered a round .018 thousandths gold platinum wire for the anterior portion of the labial alignment wire.

Bands were then cemented upon the laterals and labial arch fastened in with gold lock pins. On the mandibular teeth I used plain molar bands and both a labial and lingual wire, because of the extreme angle of inclination of the right molar, which also required rotating.

The rotation was done by removing the band from time to time and changing the position of the buccal tube until the molar was brought into a satisfactory position.

All tooth movement of the mandibular teeth including rotations were accomplished by the labial wire and while confessions are in order, I will

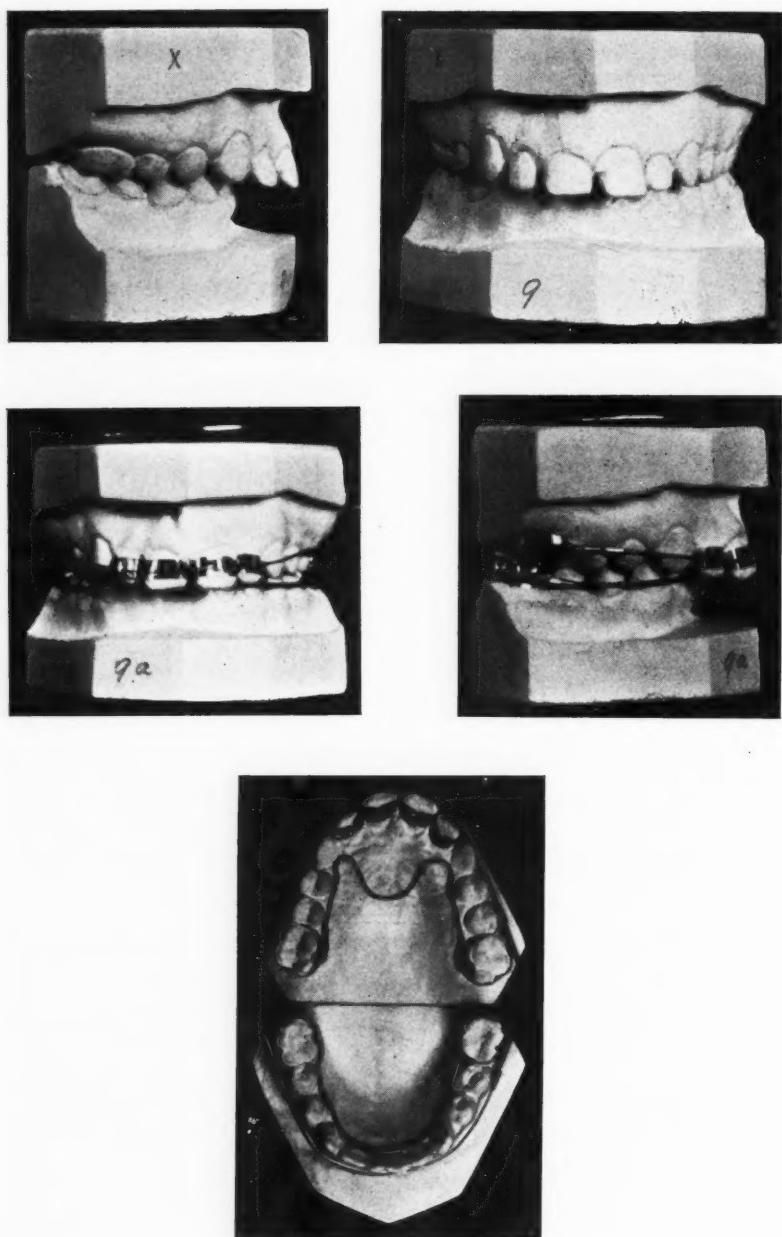


Case 8.

admit that although I cannot always rotate teeth with a lingual wire and auxiliary springs to my entire satisfaction, yet I consider them indispensable in my practice.

Case 9.—Master J. L., aged thirteen. This case presented a condition of distoclusion complicated by labioversion of the maxillary incisors accom-

panied by an excessive curve of Spee, also a lack of vertical development of the osseous tissue comprising the mandibular and maxillary molar and premolar area. There is an excessive angle of inclination of the maxillary



Case 9.

incisors and the mandibular incisors occlude with the soft tissue 5 mm. distal to the maxillary incisors.

The Hawley predetermination chart for this case, showed .096 inch radius, while the Pont index was 31 mm. and the arch form of this case in the molar, premolar and canine area was exactly correct according to both Hawley and Pont. In the corresponding Hawley chart, eighty-four one thou-

sandths showed all the mandibular teeth to be in their correct position, as far as arch form is concerned.

Therefore, the arches were practically equalized. The mandible must be brought forward. The angle of inclination of the maxillary teeth must be remedied. The excessive curve of Spee must be corrected. The maxillary and mandibular incisors must be depressed, possibly the maxillary incisors the most. The maxillary and mandibular premolars, and molars must be elongated, or probably better still we must induce vertical development of the osseous tissue supporting the premolars and molars. For this case I selected the following appliance.

I made plain bands for the maxillary first molars and stabilized these with a lingual alignment wire running as far forward as the canines. To carry the lingual wire more forward would interfere with occlusion of the mandibular incisors and the arch wire on the maxilla would be driven into the soft tissue and undoubtedly would be rocking the maxillary anchorage.

This wire was tempered very stiff and inserted into the mouth in a passive form, because I considered the arches were about correct in width. Oval buccal tubes were attached to the molar bands but not the curved variety, because I find the latter offer too much resistance to the arch wire when retracting anterior teeth. The labial alignment wire used was made of ribbon arch ends, with .018 round wire in the anterior section, which was locked into the bracket bands with the lock pins, and heavy silk ligature was tied from the rear of the buccal tubes to hooks which were previously soldered to the alignment wire.

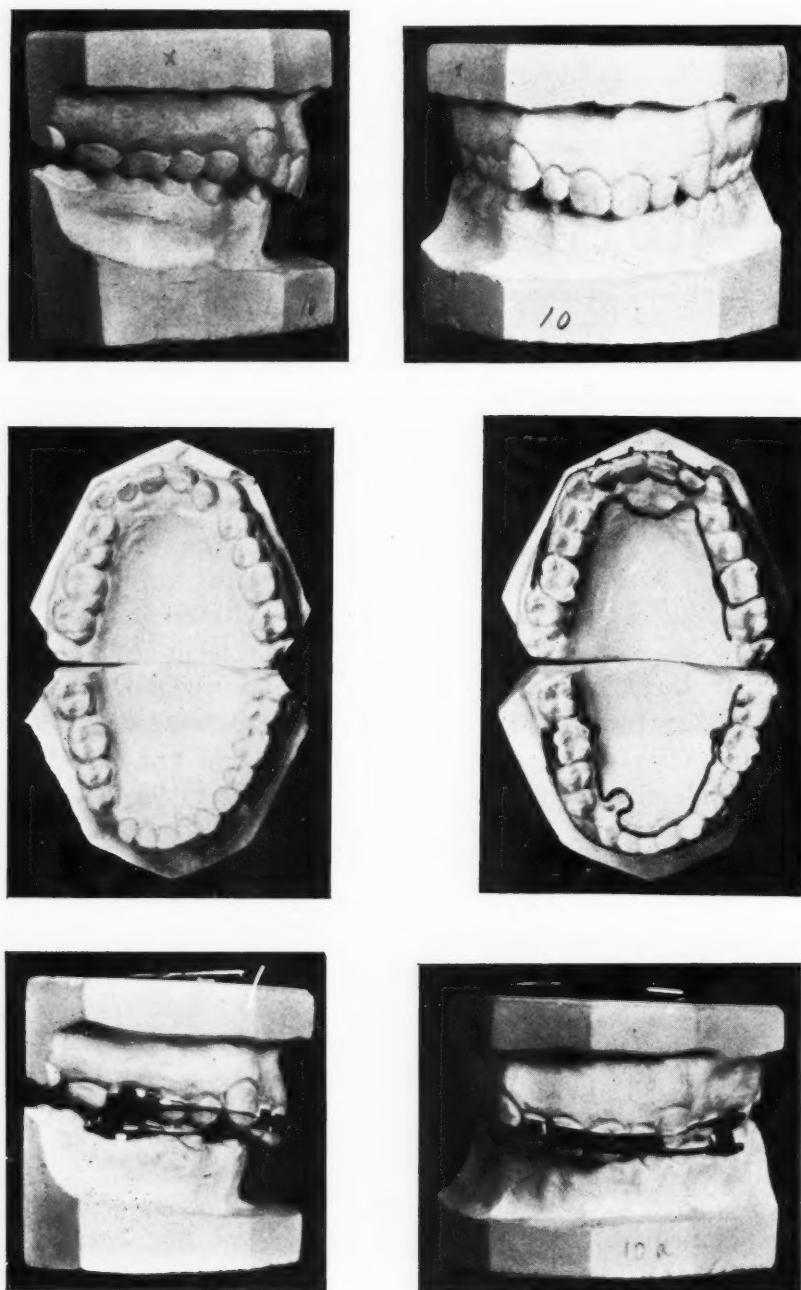
The mandibular appliances selected were lingual and labial alignment wires. The mandibular incisors were slightly depressed by the action of the labial alignment wire and ligatures, and to overcome the distal tipping of the mandible molars, bands were placed upon the first premolars with a spur riding over the lingual arch, this had an elevating influence on the premolars. You will observe there are no second molars present; otherwise, I would have resorted to Case's reciprocal appliance to straighten out this curve of Spee.

I finally resorted to Hawley's retainer on both maxillary and mandibular teeth, with a large bite plane on the maxillary retainer, and with the labial wire close to the incisive edge of the teeth, in order to prevent the incisors from moving labially and to keep the apices in their new position.

Case 10.—Master P. S., aged seventeen, presented a case of bilateral disto-clusion, complicated by linguoversion of the incisors, the central incisors in supraversion at least 5 mm.

The lower incisors were lingual to their position in the line of occlusion, and the mandibular right canine was impacted and located lingual to its correct position. The curve of Spee was not very much exaggerated. The width of the central was .32, the lateral .28, the canine .35. You will note that the canine was .03 inches wider than the central, which is not usual. The Hawley chart selected as an approximate guide was .96 for the maxillary, and .84 for the mandibular.

The Pont index was 31, which showed that the distance between the anteroposterior fissures of the first premolars should measure 39 mm. and the molar width should be 48.4 mm.



Case 10.

The dental arches in these respective areas should then be widened 5 mm. according to the Pont index, thus a great deal of expansion was unnecessary.

The centrals and laterals should be moved labially about 3 and 4 mm. respectively, while the canines seemed to be in their respective positions.

For this case I banded the first maxillary molars, and stabilized them

with a lingual removable arch wire with extensions to engage the second molars. You will observe that I did not extend the lingual forward to the anterior teeth because the mandibular incisors occluded with the soft tissue distal to the incisors and for another reason which you will soon observe.

The centrals and laterals were banded with bracket bands and a labial alignment wire consisting of two flat ribbon arch ends with an .018 round wire for the anterior portion was used to move the anterior teeth labially and to rotate them; when this was accomplished, the first premolars were banded with bracket bands, and a .020 round wire was substituted for the .018 wire, and locked in the bracket bands on the premolars.

This acted like the reciprocal appliance of Case, and corrected the supraversion of the incisors; later a ribbon arch was substituted to tip the roots labially on the mandibular teeth, bands were made for the first molars, and a removable lingual arch wire was constructed with a loop circling the unerupted canine. To this arch, extensions were run distally with occlusal rests in the fissures of the second molars, to prevent the anchor teeth from being tilted when slight pressure was applied to depress the mandibular incisors. A ribbon arch with silk ligatures was used to move the incisors labially.

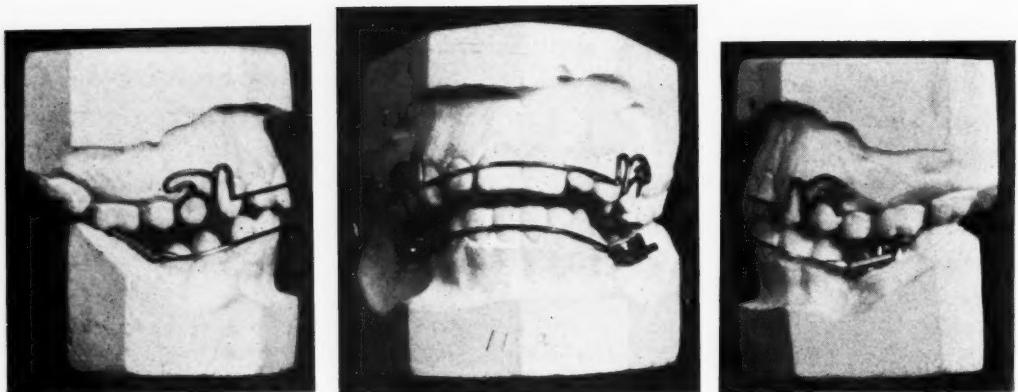
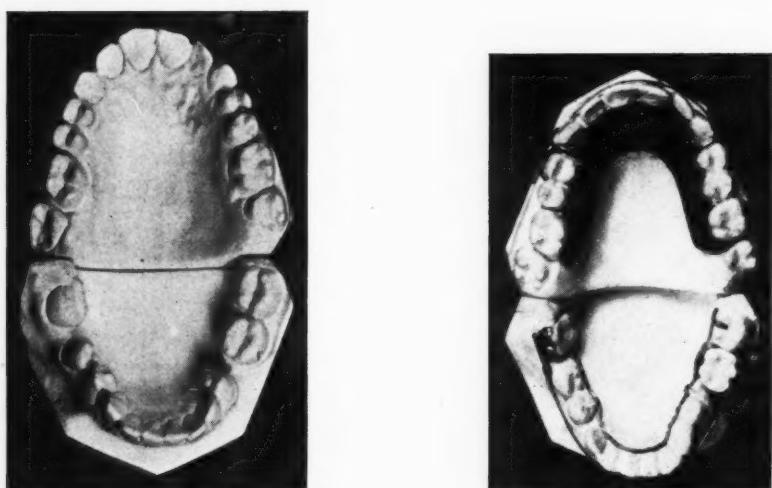
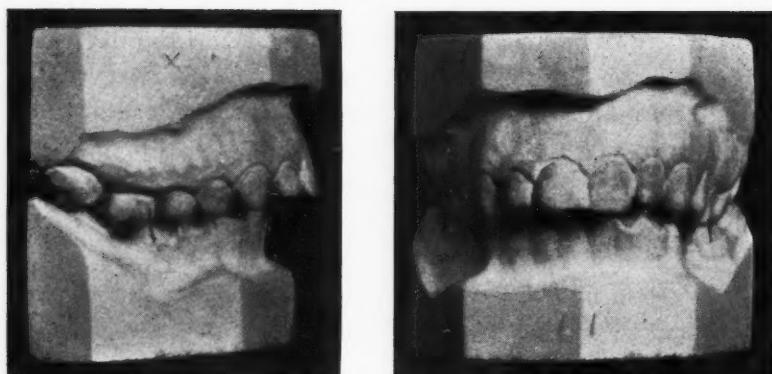
Not until the ribbon arch wire was used on the maxilla, were intermaxillary elastics resorted to, in order to bring the mandible forward, for I believe it is useless to use intermaxillary elastics where there is such interference as that of the lingually inclined incisors, especially when accompanied by a deep overbite as was this case.

This case, although now completed several years and the arch form and occlusal anteroposterior relations are all that could be desired from an occlusal viewpoint, I am not satisfied with the face form for I have established what I believe Case called a bimaxillary protrusion.

Case 11.—Miss L. B., aged sixteen, presented a mutilated bilateral distoclusion with the mandibular incisors and premolars in linguoversion, for none of the above-mentioned teeth occluded with any of the maxillary teeth. The maxilla had a full complement of teeth, while the second left premolar and the first right mandibular molar had been extracted. The second right mandibular molar was so tilted lingually that its buccal surface occluded with the occlusal surface of the first right maxillary molar, and the lingual surface of the second maxillary molar. The mandibular incisors occluded with the soft tissue distal to the maxillary incisors; all this was accompanied by an enormous curve of Spee.

The arch form of the maxilla corresponded very closely to a Hawley arch form .98. I then constructed a Hawley retainer with modified clasps and a very much exaggerated bite plane for the maxilla, in order to open the bite in the molar region.

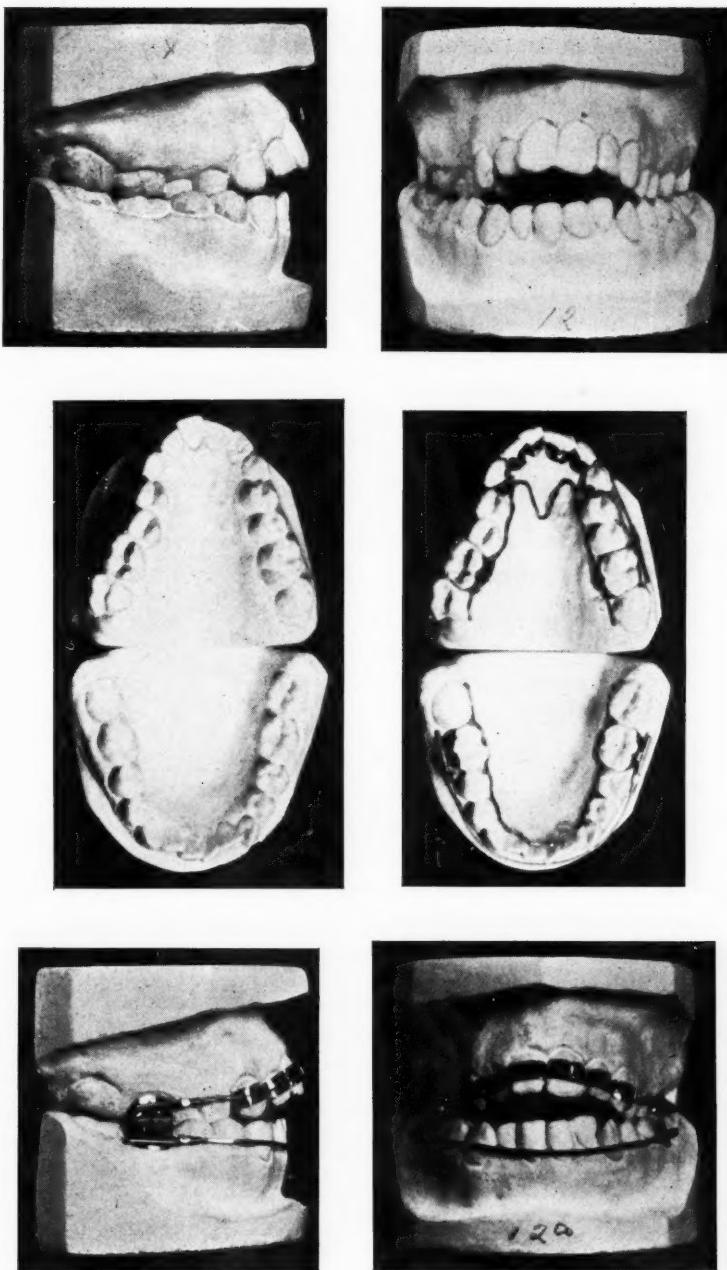
On the mandibular teeth I used a lingual removable arch wire with loops and an extension with an occlusal rest on the second left molar. I also used a labial alignment wire with oval buccal tubes. With this appliance I righted the molar and with the aid of auxiliary springs on the lingual and ligatures on the



Case 11.

labial arch, I corrected the arch form. The curve of Spee was practically corrected by the bite plate aided by the lower appliance.

I retained the lower arch with a partial plate carrying a mandibular left second premolar and a mandibular right first molar. The permanent restoration is to be completed by her dentist.



Case 12.

I might state that no other appliance was used on the maxilla but the Hawley bite plane.

Case 12.—Miss C. E., aged twenty-four, presented a case of complex neutroclusion, complicated by the maxillary first molars, premolars and canines being in linguoversion, and an infraversion of the maxillary canines and incisors.

The combined width of one maxillary central, one lateral and one canine tooth measured .90 inch. The Pont index for this case was 30. Therefore,

the first premolar width should be 37.5 mm. and the first molar width should be 46.87 mm., but the actual measurement of the premolar width was 27 mm., and the molar width was 40 mm., showing that we needed 10.5 mm. expansion in the first canine region and only 6.8 mm. in the first molar region.

The mandibular teeth apparently were very nearly correct according to the Hawley chart .78, which is the corresponding chart for the .90 maxillary.

Therefore, we needed but slight expansion in the mandibular arch, although we needed considerable rotation of the incisor teeth, and a slight tipping of crowns. Hence I chose a removable lingual alignment wire to move the molars and premolars, and a labial ribbon arch wire to move the anterior teeth labially, and to accomplish their rotation, which was completed by the aid of silk ligatures.

For the maxillary arch I used a removable lingual alignment wire, which also stabilized my molar anchorage. The widening of this appliance was done on a Leonard Adjusto-meter, because I do not think any man can exactly adjust a lingual alignment wire with pliers and keep the exact relation of the lingual wire to the molar bands, and as this is essential for anchorage purposes, I heartily recommend the Leonard Adjusto-meter for this purpose.

A labial alignment wire composed of two ribbon arch ends and an .018 round wire anterior section, was used to move the six anterior teeth labially, and to rotate them to their correct position.

When the arch form was corrected, bracket bands were placed upon the first premolars and the .018 round wire was sprung into the brackets and locked in with the lock pins.

This acted like Case's reciprocating appliance and straightened out the occlusal plane bringing the incisors down nearly to the line of occlusion.

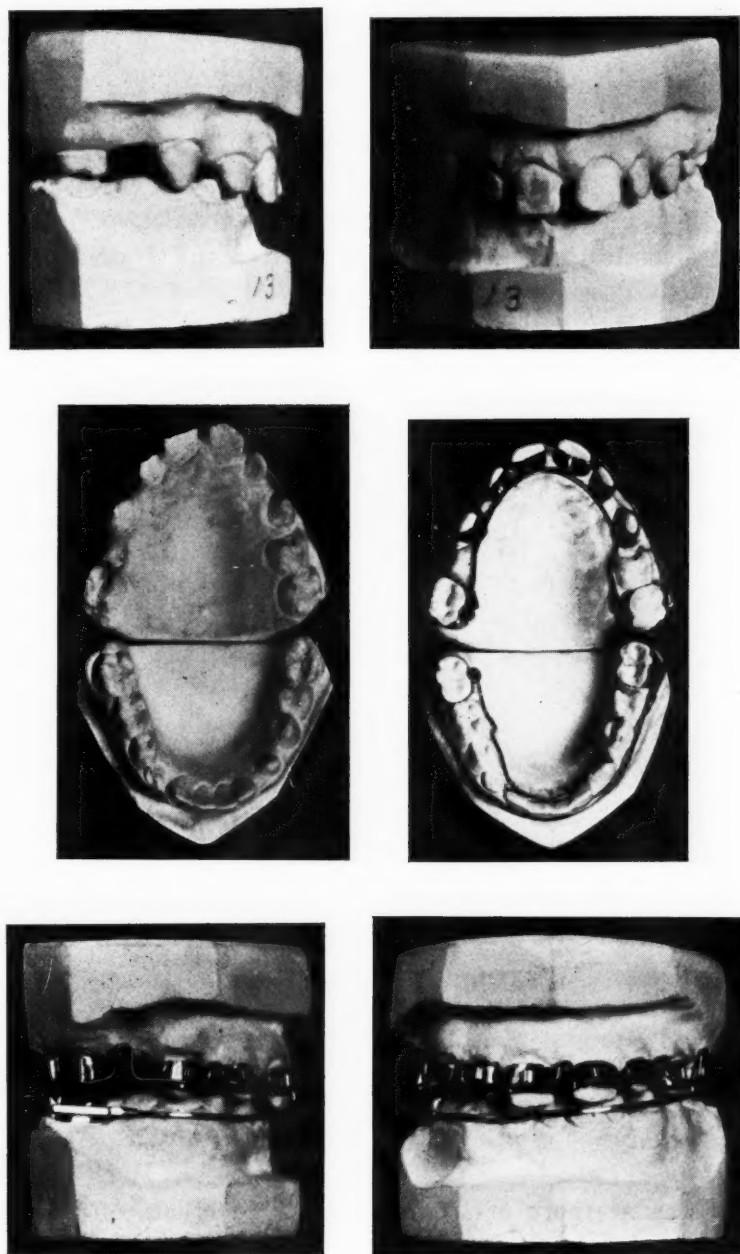
At this time I realized that the mandibular incisors were still in infraversion. I then banded the mandibular incisors and soldered two spurs to the ribbon arch, for the use of small direct intermaxillary elastics, which were attached to vertical spurs on the upper ribbon arch. The latter had replaced the round wire, in order to tilt the roots forward.

This case is now completed but I am of the opinion that the final closing of the bite could have been accomplished without the aid of the intermaxillary elastics, and as I finally had to resort to bracket bands upon the mandibular incisors, I believe they should have been used in the beginning of the case, and then I would have eliminated the silk ligatures, which I think would have been desirable.

Case 13.—Master G. B., aged eleven, presented a case of distoclusion accompanied by labioversion of the maxillary and mandibular incisors and with a congenital absence of all the maxillary premolars.

The Hawley index for this case showed a .94 upper and an .82 lower. The Pont index was 30. Hence the maxillary premolar area should be 37.5 mm. and the molar area 46.87 mm. Therefore the maxillary molars being about in their correct position, the central incisors should be moved lingually. I constructed a pin and tube appliance for the maxillary arch, augmented by a removable lingual alignment wire with two loops in order to allow for the lingual movement of the central incisors.

Half round pins and tubes, as suggested by Dr. Grieve, were used in this case and the centrals were brought together first. These pins were soldered to the .030 wire to move the canines mesially. The pins for the laterals were not attached to the base wire until the centrals were brought into approximal



Case 13.

contact with the laterals, then the half round pins were used on the laterals. In order to prevent the molars from being moved forward, auxillary springs were soldered to the lingual wire pressing the canines mesially.

After the loop between the lateral and canine had been closed, and the loop between the canine and molar had been opened to accommodate the clos-

ing of the former loop, the labial arch wire was readjusted, and the half round pins were resoldered in their newly desired position; I think this had to be resorted to on two or three occasions before the six anterior teeth were in their correct position. Then a Hawley retainer with a slight bite plane and carrying premolar teeth was used as retention.

The mandibular appliance consisted of a lingual removable arch wire with loops, in order to allow the shortening of the mandibular arch form in an anteroposterior direction, and a labial arch wire was used to correct the rotations and by the aid of coarse ligature, ligated to the labial arch wire anterior to the nuts and over the distal end of the buccal tubes. By this means, approximal contact of the mandibular teeth was obtained, after which intermaxillary elastics were resorted to. Later the Hawley retainer was used as previously described.

The reason for my choice of a pin and the tube appliance in this case is that I know of no better appliance for opening and closing spaces than the pin and tube appliance, but I use it for no other purpose, although I know that others are using it with beneficial results.

Case 14.—Miss M. McC., aged twelve, presented a mesioclusion case with all the maxillary teeth biting lingual to the mandibular teeth.

The maxillary central measured .31 inch, the lateral .26 inch; no canine being present, I measured the first molar which was .40 inch. After consulting the Hawley average table, I decided to use an .86 inch upper arch form and proceeded to develop the maxillary arch accordingly. The corresponding mandibular arch form was .74 inch, which I found was almost identical with the teeth of the mandibular arch.

For this appliance I used a lingual removable alignment wire, and the Angle ribbon arch and bracket bands on the maxillary, while on the mandibular I used a lingual removable alignment wire, and labial alignment wire with hooks for the intermaxillary elastics.

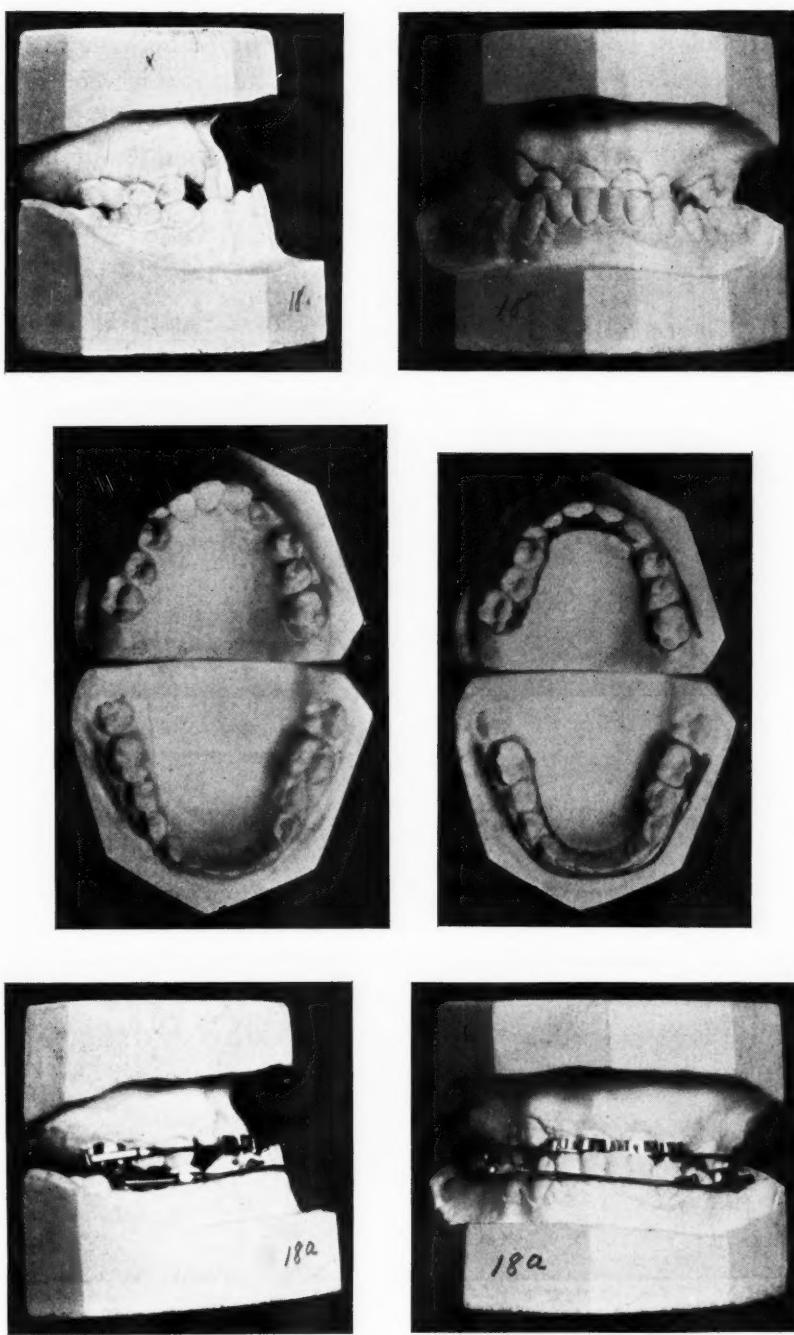
The equalizing of the arches was soon accomplished but it took almost three years to correct the anteroposterior relation of the dental arches, and I have by no means a beautiful facial result, which makes me believe my diagnosis was wrong.

Case 15.—Miss E. McC., aged sixteen, presented a mutilated condition of the mouth caused by the extraction of a first mandibular right molar which was removed because of a badly broken down and abscessed condition.

I will not attempt to classify this case by either the Angle or the Lischer classification because there are so many possible errors of judgment which would render an absolute diagnosis most difficult if not impossible by either method.

If one believed that the first maxillary molars are always constant, diagnosis would be simple if based upon such a contention, but I am convinced that this is not so.

When I posed this young lady with her mandible in a forward position, I became satisfied I could not keep it there, even if I could restore this so-called normal occlusion, which was already impossible because of the extrac-



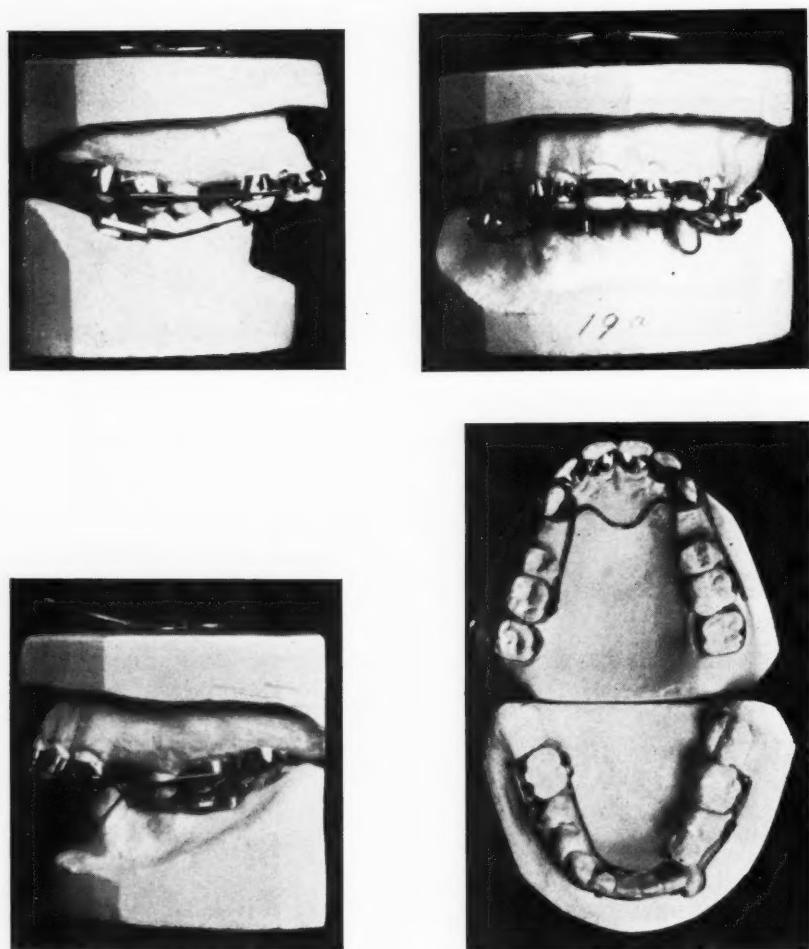
Case 14.

tion. I, therefore, resorted to the Simon method of diagnosis and I am showing you my findings and my selection of appliance in this case, and I promise to show you the results whether they be good or bad at some future date, unless something occurs over which we mortals have no control.

I have taken three gnathostatic impressions of this case so as to eliminate any possibility of error (although I am convinced this was not necessary), and have personally made the gnathostatic model.

You will note the orbital plane bisects the root and crown of the first maxillary premolars both on the right and left side, which shows the maxillary denture to be forward in its relation to the skull as a whole by the width of part of the maxillary first premolar, and half the width of the canine; in other words it is forward about 8 mm. according to Simon's method of diagnosis, while the mandible is about in its correct position.

The first maxillary right premolar was abscessed and the first left maxillary premolar was nonvital, so I decided to extract these teeth and treat



Case 15.

this case by Dr. Simon's method. I merely state this because of facts and not as an excuse for the justification of the extraction, which I would have done even if they were vital teeth, because I considered facial balance on this case with the slight loss of occlusal efficiency caused by the extraction as being tantamount if not paramount to an ideal occlusion, and the facial inharmony which must necessarily accompany the latter condition as is evidenced in this case because I do not believe it is possible to move a maxilla distal to the extent of 8 mm. without tipping the teeth, for such would have to be done

in this case for the restoration of facial harmony, but let us return to our task of selecting the appliance.

The maxillary central measured .36 inch, the laterals measured .33 inch and the canine .35 inch, indicating a Hawley upper chart of 1.04 inch for the maxillary teeth, while the corresponding lower would be .90 inch. This is the largest index I have ever measured.

The Pont index was 34 mm., which would indicate the first premolar width should be about 43 mm. and the molar width 53 mm. The actual width of the premolar region was 33 mm. while the molar width was 44 mm., showing this maxilla should be widened to the extent of about 10 mm. in the premolar region and 9 mm. in the molar region.

The mandibular arch should be developed correspondingly. According to the Hawley .90 inch lower chart the mandibular left canine which is apparently forward of its true position is in its correct position and an examination of the Simon occlusal graphs show the same.

For the maxillary arch I have constructed a removable lingual arch wire to widen the premolar and molar area and have banded both the first and second molars and joined them together for added resistance in moving the six maxillary anterior teeth distally.

For the moving of the maxillary incisors and canines, I have selected a labial appliance composed of a smooth flat ribbon arch material .022 inch and .036 inch for the posterior ends, these ends extending as far forward as the mesial surface of the canines, the latter having bands with half round tubes attached for the reception of half round pins which are soldered to the posterior or flat ribbon arch ends.

The anterior teeth have bracket bands for the reception of a round wire which forms the anterior portion of the labial alignment wire.

Hence the centrals and laterals are moved by inclination while the canines are moved bodily by the pin and tube appliance. I am indebted to Hawley for this idea for he has used it on several cases with much satisfaction. When the centrals and laterals have assumed an upright position I will substitute a ribbon arch wire with two half round pins for the canines. In the center of the ribbon arch wire I have soldered a ball for the use of the Angle traction bar and headgear, which will be worn only at night, while intramaxillary elastics or heavy silk ligatures will be used during the day.

On the mandibular teeth I constructed a lingual appliance to widen the premolar and molar area, and a labial appliance composed of flat ribbon ends, and a round anterior portion to move the incisors labially.

I am pleased to state that everything is working in this case as well as I expected and I hope to report it with its end-results, be they good or otherwise, at a future meeting.

This case was not presented for the purpose of making a plea for or an excuse for the extraction of teeth because I have taken eleven gnathostatic impressions since receiving these instruments and this is the only case where I think extraction was indicated. But I want to go on record as stating that I never understood diagnosis as I do today.

I can now tell the nature and extent of the abnormality to be corrected, .

what movements are necessary to bring about the best and most efficient occlusion possible for the case at hand, and this suggests what method of treatment will best accomplish these movements.

In conclusion I want to express the thanks I feel to all the pioneers of orthodontia who have labored long and well to bring about order, where only a state of chaos previously existed, and to remind you that what you may consider as radical today you will accept as conservative tomorrow for as Freytag has well said, "The bravest man this world has known is he who dared cut loose and think alone."

DISCUSSION

Dr. B. E. Lischer.—In regard to the first case, I want to ask Dr. Waldron if he will tell us why he put a lingual extension wire on each one of those bands. Do you not think that the abnormal side could have been treated without that lingual extension?

President Howard.—Is there any other discussion of the first case?

Dr. C. A. Hawley.—It seems to me that this case could have been treated just as simply or more simply; I am not suggesting this as any criticism of this work, but to bring out the different ways that this can be done.

Dr. Waldron could have done away with the labial arch, but using a lingual arch on the right side, the side he wished to stabilize, with a vertical tube, which compels the bodily movement of that molar, or, in other words, makes stable anchorage; and then on the other side, the lingual side, he could have used a round tube and bent it away from the other tooth; I mean a horizontal round tube. You know, you can slip such an arch in on one side, with a horizontal round tube, and then just lock it in a vertical tube on the other side.

I would suggest that as a possible means of treatment. I do not know that it would be any better but it would be another way of doing it.

Dr. Waldron.—It would be more esthetic anyway, Dr. Hawley.

Dr. Hawley.—Yes, I think the bringing out of the different ways of treating even as simple a case as this, is of great advantage.

Dr. G. W. Grieve.—In using a lingual arch, as Dr. Hawley has suggested, in place of the horizontal tube upon the molar which one desires to tip, I would place the ordinary vertical half-round tube, and solder the pin for this to a short piece of round tubing which the arch wire will telescope. A tiny spur soldered to the arch wire upon one or both sides of this short tube will prevent the arch wire from slipping through the tube. When the tipping of the molar has been accomplished, the pin for this tooth may be soldered direct to the arch wire in the ordinary way.

President Howard.—Is there any further discussion?

Dr. Burt Abell.—May I make one suggestion for flexibility in the movement of teeth where you wish to move but one side at a time?

If you have a lingual base wire attached to the molar whichever way you like (I prefer vertical tube) let it run along about $\frac{1}{4}$ inch above the gingivae, and let it come up and drop into your tube. Then on the side that you do not wish to move, bring a recurrent spring from before, backward, and engage that whole side as an anchorage, leaving the anterior end free. On the side you wish to move, make the same kind of a spring, only one for each tooth, which allows one tooth at a time to be moved, using the opposite side for anchorage where the single spring holds on three or four teeth.

President Howard.—Is there any discussion?

Dr. Fitzpatrick.—May I ask whether or not we are very prone to get decay under those soldered extensions?

Dr. Ralph Waldron.—With these soldered extensions, I caution the patients to brush those teeth, and when they come back to me I run silk in there myself. This is a round wire and I do not believe you are any more prone to get decay under those points than under any other points. At least, I have not found it so.

Dr. Stillson.—I would like to ask Dr. Waldron if he would have obtained equally good results if he had put a half-round buccal tube on the molar and inserted a removable extension in there with a half-round post and half-round buccal tube that could be removed at each sitting and the teeth polished. Usually when I use that type of band I put the half-round tube both lingually and buccally in case I may need it for some purpose.

President Howard.—Does somebody wish to discuss this case? I certainly would not treat a case of that type as Dr. Waldron did.

Dr. A. H. Ketcham.—Just for the benefit of the younger members, I want to ask Dr. Waldron a question.

Why use an extension from your lingual appliance to touch the second molars, as you have done in two cases, when they are out far enough buccally? You extended the lingual appliance back of your anchor teeth, which were the first molars, so that it touched the second molars, and those second molars were out far enough, and your first molars were in lingual positions. Why did you do this when you did not need to move the second molars outward, and you did need to move the first molars outward?

Dr. G. W. Grieve.—Case 8 will serve to illustrate the point I wish to bring out. A first permanent molar is gone. Dr. Waldron utilized loops in the main arch wire to carry the premolars distally to close the space made by the loss of the molar and to open space for the canine. In my experience, teeth may be carried along the line of the arch much more easily by the use of the light U-spring, to which is soldered a half-round pin to engage a tube upon the band of each tooth in turn. Where additional space is not required, no loop at all is necessary in the main arch wire.

Dr. J. L. Young.—Were the first permanent maxillary molars removed?

Dr. Ralph Waldron.—The teeth were removed before I saw them. The first permanent molars had been removed, I believe, some three or four months previously, while the first molars on the mandibular had been removed three years before.

Dr. Young.—Dr. Waldron has shown the ribbon arch or a modified ribbon arch with a round wire passing in to the bracket from the two lateral bands. I do not see any necessity for moving these maxillary incisors forward. You have ample room to liberate these canines if the premolar teeth are brought back into the space left where the molars were removed, and, as Dr. Grieve suggested, if I were going to use the ribbon arch, I would use the ribbon arch as made, with bracket bands on the four maxillary incisors; I would use it in conjunction with the second permanent molars as anchorage. Then with loop springs soldered to the arch wire with a pin passing in to a tube on the second premolars, I would carry them back and when I got those back, one on either side, I would change the loop spring and carry the first premolars back. I would have room, then, for the canine.

Dr. Waldron.—That was a successfully treated case, and I am showing it exactly as I brought it, because I expected we would have a great deal of discussion on this particular thing, and it has brought out exactly the things I wanted to emphasize.

A PRELIMINARY REPORT OF INFRAOCCLUSION OF THE MOLARS AND PREMOLARS PRODUCED BY ORTHOPEDIC TREATMENT OF SCOLIOSIS*

BY CLINTON C. HOWARD, D.D.S., ATLANTA, GA.

Orthodontist to the Scottish Rite Hospital for Crippled Children

THE requisites for obtaining a more correct alignment of a lateral curvature of the spine are fundamentally similar to the principles employed by the orthodontist in influencing the shape and relationship of the arches and jaws.



Fig. 1-a.



Fig. 1-b.

Fig. 1.—Illustrations *a*, *b*, *e*, and *f* are records from the Scottish Rite Hospital; *c* and *d* were made by the author after the cast had been worn forty days.

In the treatment of scoliosis, the orthopedist applies a plaster cast which extends from the hips to the mandible and occipital, and by a gradual increase in the length of the cast a stretching of the torso is obtained. The two points offering the greatest resistance to the pressure applied would be expected to undergo changes in accord with the tangible principle of bone growth. The weight of the head, augmented by muscle pull (Fig. 1, *a* and *b*), produces an almost constant upward pressure upon the lower border of the mandible. That a depression of the molars and premolars (Fig. 1, *c* and *d*) with a consequent derangement of the anterior teeth would occur, should not be a surprise to the orthodontist. In fact, should an infraocclusion of

*Presented before the Southern Society of Orthodontists at Louisville, Ky., March 30, 1926.



Fig. 1-c.



Fig. 1-d.



Fig. 1-e.



Fig. 1-f.

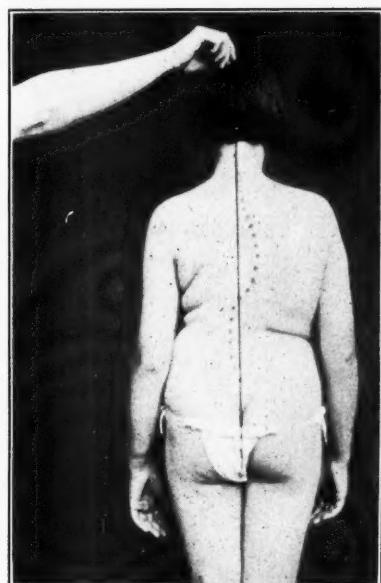


Fig. 2.—Scottish Rite Hospital record illustrating the spinal curvature in Fig. 1.

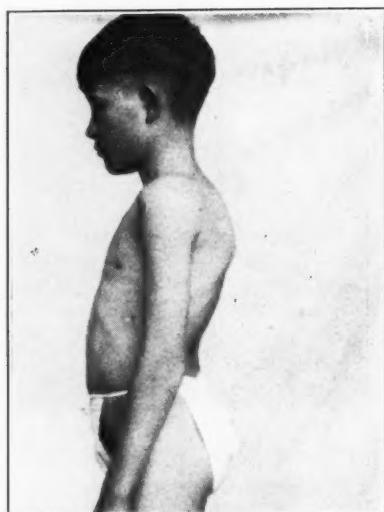


Fig. 3-a.



Fig. 3-b.



Fig. 3-c.



Fig. 3-d.



Fig. 3-e.



Fig. 3-f.

Fig. 3.—Illustrations *a* and *b* are records from the Scottish Rite Hospital, and picture the case before (*a*) and after (*b*) the torso cast was worn; *c*, *d*, *e* and *f* were made by the author after the case was dismissed from the hospital.

the posterior teeth not be produced, the very fundamentals of orthodontic treatment would be questioned.

Although this case was presented for orthodontic observation forty days after the application of the torso cast, the hospital photographic records very definitely indicate the rapid changes in facial length; compare (e) and (f). A history given by the child's mother quite definitely established the fact that only three weeks of cast pressure produced marked infraocclusion of the posterior teeth.

From the history (Fig. 3) obtained from the parents, orthopedist and hospital attendants, a perceptible shortening of the lower part of the face was produced in a period of six months; compare *a* and *b*.

It is believed that a definite infraocclusion with an accompanying deflection of the maxillary anterior teeth (*c* and *d*) was established within sixty days after the orthopedic cast was applied. This patient has been dismissed from the hospital but will return in four months for orthodontic observation. It will be very interesting to observe the amount of recovery this case will present after a "rest" period of twelve months.

A method has been devised for the purpose of maintaining the relative position of the opposing teeth during the torso stretching process. A removable splint will be employed. This apparatus, adjusted to the maxillary and mandibular arches, can be removed by the attending nurse to allow a freedom of mastication and prophylactic care. This, or any other intra-oral appliance, will not prevent a depression of the teeth nor a shortening of the lower one-third of the face. With the twelve anterior teeth, as added resistance, and creating a unit of all the teeth of each arch, it would follow that the shortening of the lower face would be materially decreased; and the deflection of the maxillary incisors and canines would be definitely checked.

It is the opinion of the author that some "open bite" cases are the result of a supraocclusion of the molars. It is only possible to arrive at a diagnosis by a study of facial length. Should the distance from the nose to the chin be definitely in excess of each of the upper two measurements, the open bite should not be closed by the downward movement of the maxillary incisors and canines, but a depression of the molars is indicated. A torso plaster cast should accomplish for the open bite created by a supraocclusion of molars in accord with the results produced as above described.

A subsequent report will deal with our success in maintaining the relative positions of the teeth under extraoral pressure, together with an accurate record of the degree of recuperation of those cases now under observation.

DOES BONE FORM FROM OSTEOBLASTS OR FROM A METAPLASIA OF THE SURROUNDING CONNECTIVE TISSUE?*

BY DR. MED. CARL ROHDE, FREIBURG, GERMANY

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Surgical Clinic of Geheim Medizirrat, Professor Dr. E. Lexer, University of Freiburg*

(Continued from April)

4. CIRCULATORY SYSTEM AND BONE REGENERATION

This question can be answered only in connection with sections 1 and 3. In a résumé, the following will again be stated. Every bone regenerative process is intimately associated with an undamaged blood supply to the osteoblasts and at the seat of the lesion with a fracture hyperæmia setting in at the right time and continuing undisturbed for a sufficient length of time. If the circulatory supply is primarily damaged, or in the course of the regenerative process too early destroyed, bone regeneration does not take place. Such damaged parts, especially under the influence of undesirable mechanical stimuli, are replaced, to a certain extent, by the degeneration of the part and partly by the connective tissue of the immediate vicinity.

Damaging the blood supply leads to pseudo-arthrosis. Conditions are unfavorable with reference to marrow and endosteum, even when operatively the blood supply is retained. Through its own callous formation at the ends of the marrow canals, the ends of the marrow and endosteal tubes, lying in the defect, are early cut off from their source of nourishment. In substantiation of Lexer's findings we could prove that, after damage to the vascular supply of the marrow and endosteum, the periosteal circulation takes a part in furnishing a new supply, in that perforating blood vessels grow through the callous mass or through its own callous mass into the marrow canal. (Fig. 16.)

5. BONE REGENERATION AND CONNECTIVE TISSUE

In our experiments we could prove the viewpoint of Lexer, that the connective tissue may be derived from two sources: first, from the connective tissue of the periosteum, marrow, and endosteum; second, from the immediate surrounding connective tissue.

We have already explained that the periosteum as a whole, when it is separated from its source of nourishment (blood supply), undergoes connective tissue degeneration. As a result of cutting off the fracture hyperæmia it cannot reach the cambium layer at the right time, and the cambium layer is badly damaged and can build no bone. In such cases the stump ends are covered by connective tissue resulting from the periosteal degeneration while the defect itself is bridged by this connective tissue (Fig. 4). In the same manner the adventitia and the connective tissue of the fibro-elastic layer can hinder the bony union and bridge the defect by means of a connective tissue strand.

*Translated by Erwin R. Schmidt, B.A., M.D., F.A.C.S., Chicago.
Reprinted from *Surgery, Gynecology and Obstetrics*, December, 1925.

if the cambium layer is separated from the adventitia and fibro-elastic layer (periosteal tube, old animals, Fig. 5). The gradual pushing forward of the callous formation, which in such cases comes from the cambium layer which has retained its normal relationship, blocks, in one way or another, the previously formed connective tissue of the periosteum because it sinks into the small corners, holes, and the defect early and fills them out. The adventitia grows if the regeneration of the cambium layer is interrupted by haemorrhage or the too early closing of the compact bone through the unspecific connective tissue of the surrounding tissue, forming a covering over the stump ends. The mushroom-like callus of the marrow and endosteum plays a part in the formation of the connective tissue of the defect. In the same manner the adventitia may cover up the marrow canal or grow into it, if a myelogenous-endosteal callous formation does not take place at the right time. At places of especial mechanical stress, the connective tissue-like stages of periosteal callus remain a long time and develop fissures which are gradually replaced by bone (Fig. 10).

From the marrow and endosteum, connective tissue develops in places where the nourishment is limited, or in those places where damage has resulted to the marrow and endosteum or its blood supply by undesirable mechanical stimuli. Under the influence of such disturbance, bone formation does not take place in the already formed precallous tissue. From the marrow and endosteum there develops into the defect, because of impairment of the blood supply of the nutrient artery, a tissue, rich in cells, which gradually changes to a fibrillary connective tissue. These same processes take place in the marrow canal, if the nutrient artery is destroyed during operation. In such cases, connective tissue formation begins deep in the marrow canal, and extends out of the canal and advances into the defect. Developing in one way or another, such myelogenous-endosteal connective tissue takes part in the formation of the connective tissue of the defect (Figs. 12 and 14).

This connective tissue resulting from degeneration of the different tissues of the bone is increased through connective tissue which arises from the unspecific connective tissue of the surrounding region. Where larger periosteal defects, destruction of the cambium layer, or damaging of the circulation hinder beginning regeneration at the right time by the specific bone building cells, the unspecific connective tissue of the immediate area grows too early into the spaces (Figs. 4 and 5). Especially is this the case when at the same time damaging mechanical influences may be present. Thus the unspecific connective tissue of the vicinity unites with the connective tissue degeneration of the periosteum, as explained above, as an obstacle to bone formation. Where the periosteum is loosened or removed from the compact bone, the blood and lymph vessels of the vicinity become organized by the connective tissue, so that at a later stage the outer surface of the bone is everywhere attacked by granulations and covered by the usual connective tissue (Figs. 12, 14, 17, 18 and 20). In such cases the unspecific connective tissue of the vicinity, because it develops earlier than the processes of bone regeneration, is a hindrance to regeneration and bone formation. At these places the incompletely regenerated cambium layer overcomes for a short distance the unspecific con-

nective tissue; a useless attempt of the unspecific bone regeneration, which results in a victory of the connective tissue and the destruction of the osteoblasts. The unspecific connective tissue of the vicinity wanders far into all the defects of the marrow and endosteum (Figs. 17, 18, 20) and organizes the blood and lymph present there. In this early developed connective tissue, specific bone regeneration by the marrow and endosteum finds an unsurmountable difficulty. Furthermore, we could prove that, with an intact cylinder of marrow and endosteum, the part of the cylinder in the defect is replaced partly by connective tissue developed from itself and partly from granulating tissue of the vicinity (Figs. 12, 14). For the most part it is the damage of the marrow and endosteum as a result of cutting off its blood supply, in addition to damage, haemorrhage and necrosis, as a result of being easily damaged, which causes the growing in of unspecific connective tissue in the vicinity of the damaged places. In later stages the fibers coming from the marrow and endosteum, from the periosteum, and from the connective tissue of the vicinity per-

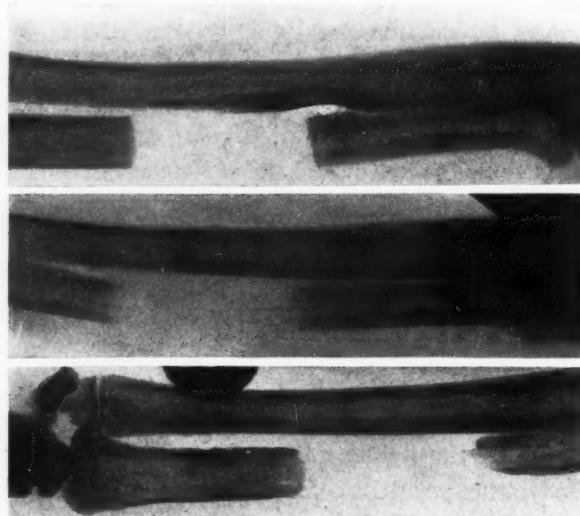


Fig. 18.—Showing the total defect of the radius (2.5 centimeters) in a young cat. These roentgenograms were taken immediately after the operation and 4 and 19 weeks later.

meate everywhere, so that the defect is completely filled by a firm scar tissue coming from different places. As a result of connective tissue degeneration of the bone building tissue itself, or as a result of its replacement by the non-specific connective tissue of the vicinity, pseudo-arthrosis develops, the latter, however, is due to nutritional disturbance of specific bone-building parts or due to far reaching damage and separation of its osteoblasts.

If the nutrient arteries are intact and cause the myelogenous-endosteal bone building to set in at the right time, the mushroom-like callous masses will be covered under certain conditions by non-specific connective tissue of the vicinity together with periosteal connective tissue (Figs. 12, 14). The fibrous degenerated remains of the marrow and endosteum lying between mushroom-like calluses of the marrow unite with the periosteal and unspecific connective tissue and form a connective-tissue bridge between the incompletely regenerated bone stumps. If the nutrient arteries are destroyed, the connective tissue of

the vicinity granulates into the marrow canal and fills it, more or less, before a myelogenous-endosteal callous formation can take place after the collateral circulation has developed and started regenerative processes. Finally, after development of the collaterals, we have seen delayed callous formation in small amounts, from the marrow and endosteum. In its further growth the callous formation will be hindered by the previously developed masses of connective tissue. In such cases, with destroyed nutrient arteries but with intact cylinders of marrow and endosteum, the replacement with unspecific connective tissue of the vicinity goes so far that not a trace of marrow or endosteum can be demonstrated in the defect. As a result of the destruction of the blood vessels in such cases, the marrow and endosteum remain only deep in the marrow canal and otherwise are replaced by the nonspecific connective tissue of the vicinity.



Fig. 19.—Total defect of ulna in young rabbit. Roentgenograms taken immediately after operation and 8 days and one month later.

Compact bone, which had its periosteal covering as well as the marrow and endosteum removed, was covered on all sides by a non-specific tissue coming from connective tissue of the vicinity and as a result of its absorbing influence the bone becomes porotic. Before regeneration can set in from the edges of the remaining periosteum, marrow, and endosteum, the non-specific connective tissue of the vicinity has attached itself everywhere and stands in the way of every progressive regenerative process of the specific bone building parts.

These processes were previously demonstrated by a series of experiments (Figs. 12, 14, 17 and 18). We wish to elaborate them through illustrations from our experiment in which, in a young rabbit, a cylinder of periosteum, compact bone, and marrow and endosteum, 1 centimeter long, was removed from the upper third of the ulna, and centrally and peripherally a shell of compact bone freed of periosteum, marrow and endosteum, was formed. At the end of the operation a fracture of the half shell of peripheral fragment developed, just within the part covered by periosteum. Suture. A plaster-of-Paris splint was applied and worn 4 weeks. Figure 19 shows the condition immediately after operation, and after 8 days and after 1 month. After 8 days there are no changes. After 1 month the central fragment is united with the radius by means of a callous mass. There is a well

developed callous mass at the distal fragment, which unites the broken off piece with the stump. Histologically (Fig. 20) we can see how the outer surfaces of the compact bone are walled in and everywhere eroded by the non-specific connective tissue. The same is true with reference to the bone freed from marrow and endosteum; one can see how the non-specific connective tissue of the vicinity has grown into the marrow canal. At the peripheral fragment (complete removal of the marrow and endosteum), the whole marrow canal is filled by the connective tissue of the vicinity, while the central fragment (marrow and endosteum retained) shows in contradistinction a small amount of callous formation deep in the marrow canal, in advance of the connective tissue of the vicinity which has grown in.

On the other hand we could confirm that wherever the periosteum or marrow and endosteum were well nourished and retained, and where the fracture hyperæmia could develop, unhindered bone building results through the specific bone building activities of the osteoblasts. In such cases small blood

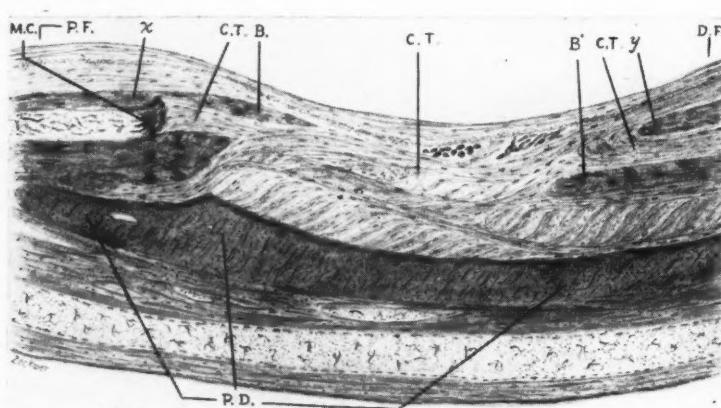


Fig. 20.—Drawing of section of bone in same experiment as shown in Fig. 19. *P. F.*, Proximal fragment; *X*, *Y*, site of operation; *C. T.*, connective tissue of defect and of vicinity; *B.*, compact bone; *D. F.*, distal fragment; *P. D.*, periosteal radius defect; *M. C.*, myelogenous endosteal callus; *U.*, ulna; *R.*, radius.

or lymph exudates could not hinder the specific bone-building regeneration. However, the blood and lymph exudate do not offer the best conditions for bone building, and the best regeneration sets in where no extravasation of blood is present. Extravasation of the blood always is a damaging influence when the bone-building tissues have been disturbed or their source of nourishment interfered with. At these places the extravasation of blood is very early replaced by the non-specific connective tissue of the vicinity and forms scar tissue which is an insurmountable difficulty for beginning bone regeneration which sets in late. These views of Lexer are confirmed in our animal experiments.

Furthermore it develops that under the influence of undesired mechanical stimuli, the tissue of the non-specific connective tissue of the vicinity predominates. These facts, in connection with similar facts regarding the periosteum, marrow and endosteum, as explained previously, cause us to see in our animal experiments a further proof for the views of Lexer that the first weeks are very important, for fracture hyperæmia and bone regeneration and mechanical stimuli should be eliminated as much as possible.

At the same time important conclusions can be drawn from our regeneration experiments with reference to the question of metaplasia, which will be considered more fully in the following section. The *connective tissue elements of the periosteum, the marrow and endosteum, as well as the non-specific connective tissue of the vicinity never develop through metaplasia into bone.* Not once in these experiments in which the connective-tissue-like granulations of the marrow and endosteum seemed to meet with those of the periosteum, did bone formation appear. The connective tissue through metaplasia takes no part in bone regeneration. Bone is formed more readily when the specific bone building cells (osteoblasts) undamaged and in normal relationship with their blood vessels are present. These last findings, in a certain measure, form a basis for the following section.

(*To be continued*)

AN APPLIANCE USED ON AN ADVANCED MUTILATED CASE*

BY NORBORNE F. MUIR, D.D.S., ROANOKE, VIRGINIA

THIS appliance is shown because it is original so far as the author is concerned.

The patient on whom the appliance was used was an adult who had undergone orthodontic treatment for several years previously. The mandibular right first and second molars were in buccal occlusion. The mandibular left second premolar and first molar were lost. The mandibular left molar was in distolingual occlusion.

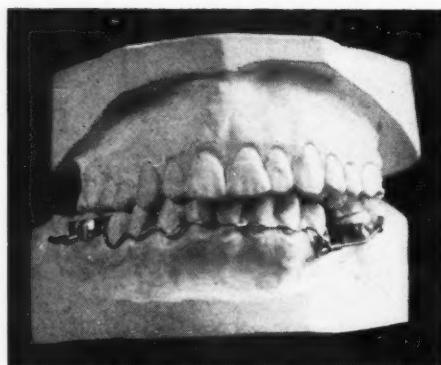


Fig. 1.

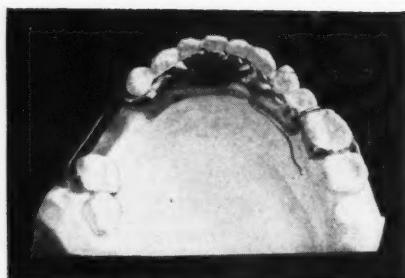


Fig. 2.

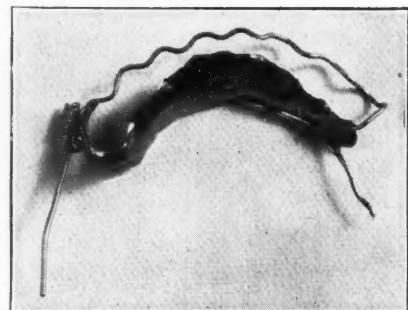


Fig. 3.

The object was to move the mandibular right molars lingually, and to move the mandibular second molar mesially and buccally. The advantage of the appliance used was that it was a removable stable appliance anchored to the anterior teeth capable of moving the posterior teeth.

A band was placed on the right first molar with a spur extending to the buccal of the second molar, and a vertical hook on the lingual of the first molar band. A band was placed on the left molar with a horizontal buccal tube. A plate of gold was burnished to the lingual surfaces of the eight

*Clinic read before the Twenty-fifth Annual meeting of the American Society of Orthodontists, held at Atlanta, Ga., April 14-17, 1925.

anterior teeth, and a .022 spring gold wire was adapted to fit the labiogingival borders of the same teeth. The gold plate was strengthened with solder and was attached to the labial wire. A horizontal tube was soldered to the plate on the buccal of the left first premolar. Through this tube and the tube on the buccal of the second molar was placed a .022 wire with hook on anterior extremity.

A rubber or silk ligature was placed from the anterior hook to the distal of the tube on the molar, and was used to carry the molar forward on the wire which was bent in position to direct the molar buccally. A .022 finger spring, soldered to the lingual plate at the canine region, was bent lingually and sprung to engage into the vertical hook on the lingual of the right molar band. This finger spring was used to bring the right molars lingually.

The appliance has a very limited use, and is only recommended in this or some similarly unusual type of case.

APPLIANCE FOR ROUGH TRIMMING OF PLASTER MODELS*

BY URLING C. RUCKSTUHL, D.D.S., ST. LOUIS

THE photographs show a slightly improved pattern of the cutter shown for me by Dr. Koeh at Atlanta.

Cutting plaster with an office knife is rather hard on the index finger. While watching a friend try to cut plaster with a saddler's knife, without success, I remembered a visit to a large dairy farm when quite young. On this

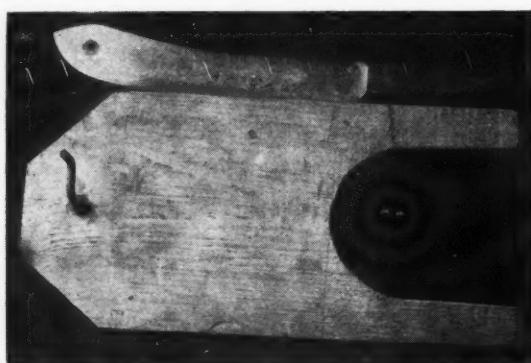


Fig. 1.



Fig. 2.

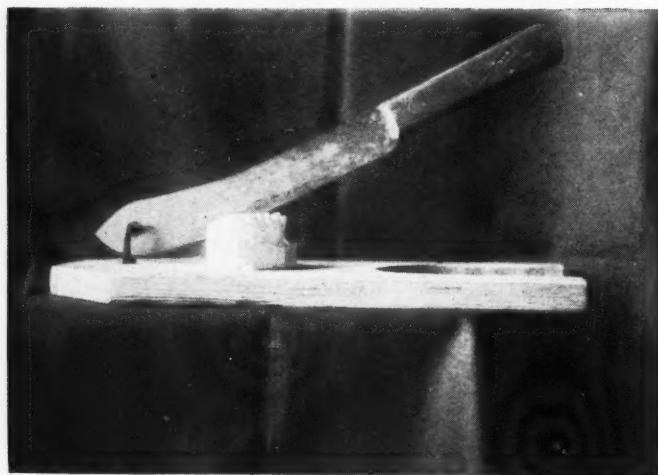


Fig. 3.

*Clinic read before the Twenty-fifth Annual meeting of the American Society of Orthodontists, held at Atlanta, Ga., April 14-17, 1925.

farm wooden shoes were used to a great extent, and were all made on the place, and the principle of making these wooden shoes I have applied to this cutter.

Fig. 1 shows a top view of the board with the one-fourth inch iron pigtail, and a large carving knife of good quality with a hole bored in it to slip over the iron pigtail.

Fig. 2 shows the knife in position.

Fig. 3 shows how the model is placed in position for trimming.

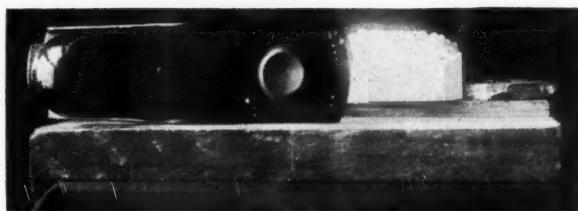


Fig. 4.

The knife should be ground so that the bevel is on the side away from the model. This cutter will not give a smooth finished model, but will trim one to shape accurately and in a very short time.

The only difficulty found in making this cutter will be boring the hole in the knife.

Fig. 4 shows a board I use in connection with a carpenter's block plane that will put a smooth finish on a model very perfectly, and also very quickly.

CASE REPORTS*

BY HORACE L. HOWE, D.M.D., BOSTON, MASS.

Assistant Professor of Clinical Orthodontia, Harvard University Dental School

CASE I.—Figs. 1, 2, 3-A and 3-B are models of a child's mouth showing the expansion of the maxillary arch due to function, during the process of expanding the mandibular arch. Work on the case was started in November,

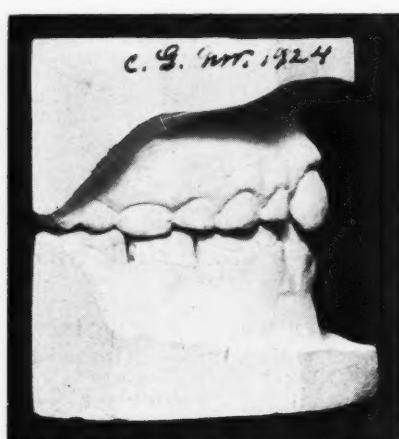


Fig. 1.



Fig. 2.



Fig. 3-A.



Fig. 3-B.

1924. A mandibular lingual arch was applied to the second deciduous molars. The child was seen seven times up to April, 1925. The mandibular right lateral was carried into a very good position simply by the pressure of the lingual arch. The mandibular arch was expanded 4 mm. See Figs. 3-A and

*Read before the Twenty-fifth Annual meeting of the American Society of Orthodontists held at Atlanta, Ga., April 14-17 1925.



Fig. 4.

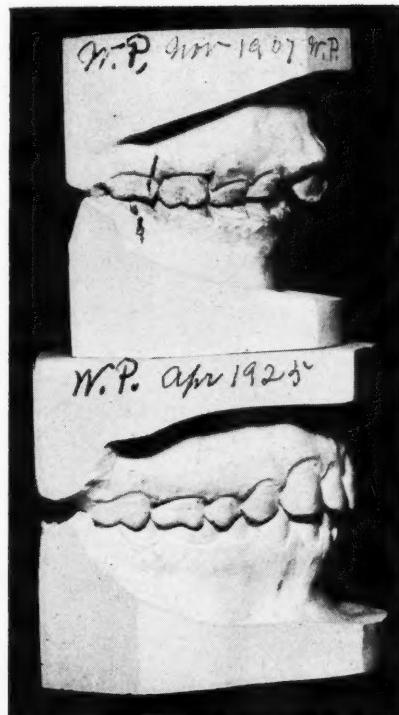


Fig. 5.

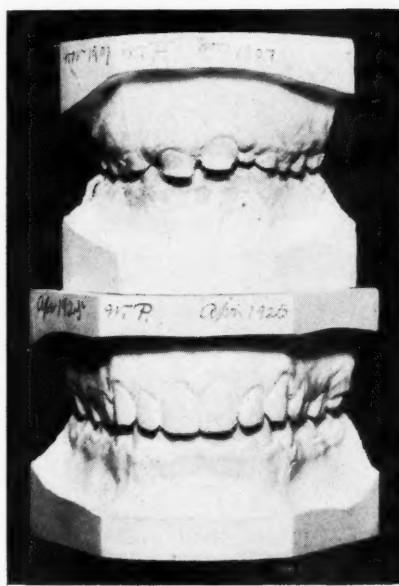


Fig. 6.



Fig. 7.

3-B. The maxillary arch was expanded 2 mm. without appliances, but due to function only. No instruction was given for special exercises.

CASE II.—Figs. 4, 5 and 6 show models of a case first started by me in 1907. The patient, W. P., was a boy of about eight years with a typical



Fig. 8.

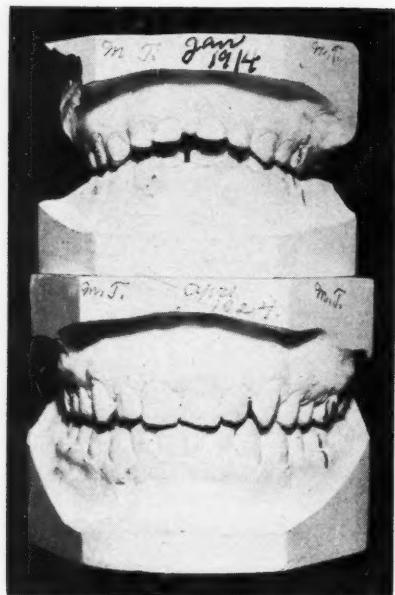


Fig. 9.



Fig. 10.



Fig. 11.

Class II condition. Extreme protrusion of maxillary incisors with distal occlusion existed.

The case was treated in the routine way with labial expansion arches and intermaxillary elastics. There were frequent periods of rest from treatment

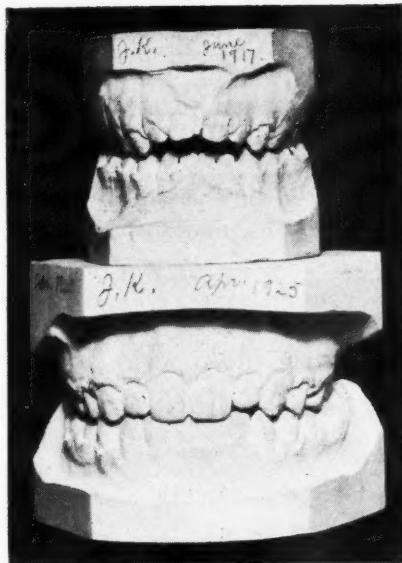


Fig. 12.

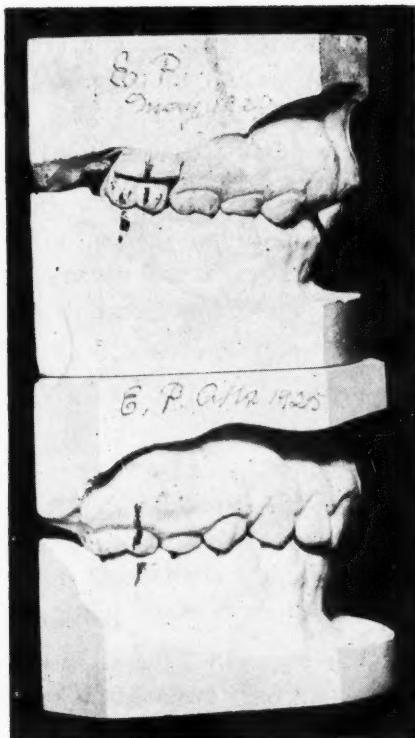


Fig. 13.

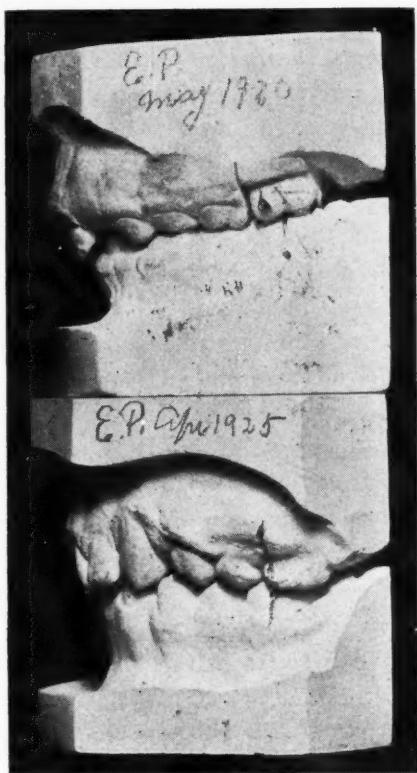


Fig. 14.

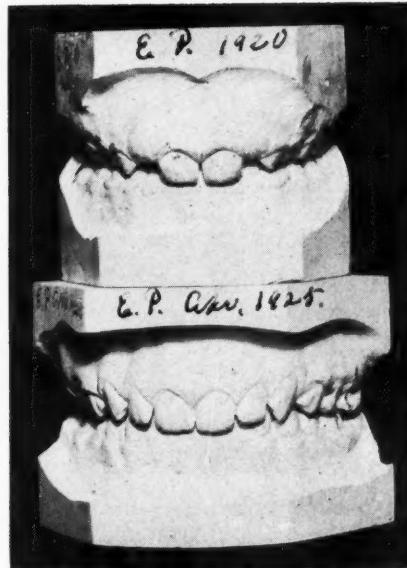


Fig. 15.

due to trips to Europe, and to a school in the West. Appliances of some kind were worn until the premolars were well erupted. In April, 1925, the models seen in the lower half of Figs. 4, 5 and 6 were taken. These models were made many years after all appliances were removed. The premolars are shown to be well settled and the overbite is quite satisfactory.

CASE III.—Figs. 7, 8 and 9 show models of the teeth of a child of five years who was a thumb-sucker. The lower models in the illustrations show conditions ten years later. An inclined plane attached to a mandibular pre-molar was removed from this case about a year ago.

CASE IV.—Figs. 10, 11 and 12 show models of the teeth of a child of five, in the upper part of the pictures. These models were made in 1917. A labial arch was applied to the maxillary teeth, and also to the mandibular teeth. Elastics were used more or less up to the present time, when a removable Hawley plate was applied. This case was the most extreme that I have ever seen. The condition at the present time is shown in the lower half of the pictures. The child still wears a Hawley retainer and one mandibular pre-molar band with an inclined plane soldered to it.

CASE V.—Figs. 13, 14 and 15 show models of the teeth of E. P., a child of about seven years old. In this case there was an extreme Class II condition. The overbite was marked. The father of the child has a very marked case of the same type. A labial arch was applied to the maxillary teeth, and a lingual arch was attached to the second deciduous molars of the mandibular arch. Intermaxillary elastics were used. At one time for about one year, an inclined bite plane was used to correct the overbite. This bite plane was attached to bands on the maxillary centrals. The condition at the present time is shown in the lower half of the illustrations.

**DEPARTMENT OF
ORAL SURGERY, ORAL PATHOLOGY
AND SURGICAL ORTHODONTIA**

Under Editorial Supervision of

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**SURGICAL CORRECTION OF VARIOUS TYPES OF MALRELATION
OF THE JAWS***

By V. P. BLAIR, M.D., ST. LOUIS, Mo.

BEFORE starting I want to take occasion to say that I spent the afternoon in Dr. Silverman's Clinic and I have never seen more carefully calculated and beautifully executed harelip and cleft-palate surgery than he exemplified for our instruction.

I was flattered and pleased to be asked to address you because you represent one of the very exact branches of surgery. I am rapidly getting to the point where mentally I cannot make a distinction between a dentist and a surgeon. They are all practicing medicine according to my viewpoint. Their technic is a little different; the places they work on are different, but to me it is all medicine.

When I was asked rather persistently to give didactic talks to a society of this kind, I thought it might be interested in observations that I could demonstrate, so I picked out a series of lantern slides about the part that you are interested in and that will be the basis of my talk. I will commence with some remarks on ankylosis of the jaw. Incidentally, in spite of the amount that has been written on this subject in this country, the correction of ankylosis of the jaw is very old.

The first condyle was removed in about 1850 by an English surgeon. Bottini, in 1872, published an article on this subject which classified the work. Kernig or one of those Germans did some work on it in 1878, and before 1890 the whole subject was about finished, yet it has been repeatedly introduced as original material.

A fall on the chin or an infection causing trouble around the joint may cause either a fibrous or a bony ankylosis. The first case that was ever operated upon was for an enlarged condyle of the jaw.

NOTE:—The original paper was given with and dependent on lantern slide demonstration: without the slides, the observations and conclusions will not be as clear as desirable.

*Read before the Twenty-fifth Annual Meeting of the American Society of Orthodontists held at Atlanta, Ga., April 14-17, 1925.

The side of the jaw that is ankylosed will show a shorter ramus than the unankylosed side, and that is why the chin deviates to the ankylosed side.

It was with a good deal of trepidation that I operated upon the first double ankylosis, but it had been operated on before so I was willing to take a chance. But it seemed to me that if our ideas on the subject were correct and the fulcrum was taken away from the second class lever, which the jaw is, the power being in front, then the power would be behind the molar teeth which would become the fulcrum; there would be a first class lever and when that person undertook to close his jaw it would fly open, that is, if our ideas of the joint are correct. The fact that it does not happen shows that there was something wrong in our calculations. Although the presence of a normal condyle is essential in the developing jaw, it is not a later essential. The jaw is hung in such a perfect muscular balance that both condyles can be removed, and where desired one or both rami can be moved forward without seriously crippling function.

I have seen very few people call attention to the fact that the whole face is deformed in these cases, and most of the operative procedures are for the jaw function alone. Corrections of deformities should be made by bringing the jaw into position and holding it there either by interdental wiring or rubber bands; the chin may even be cut loose and lined up with the rest of the face, or the oblique chin may be built up with a cartilage transplant.

One of the most complicated cases we have had was a man who had been injured eight years before and came in with ankylosis on both sides, a loss of bone on one side, and an ununited fracture on two sides. The operation consisted first in fraying the ankylosed ramus without taking out any bone. Then Dr. James A. Brown of St. Louis, who has been my stand-by for years in doing these things for me, made a contrivance with a splint on the maxillary teeth and a jackscrew that goes back and pushes the ramus back in place. There is a lower contrivance that fastens to the upper to hold the bones in place. It is as pretty as a piece of jewelry. The body was shifted around and wired on one side leaving a large space which was filled in with a bone graft. After the bone graft had united we went back and cut out the condyles, brought the jaw forward and gave him motion.

Ankylosed jaws due to scar bands in the cheek may have enlarged and nonfunctioning condyles, but in the treatment of these cases it is often necessary to remove all the scar and epithelialize the raw areas with skin grafts or pedicle grafts. The cheek must have a lining and if raw areas are left the contracture will recur.

I will dismiss this subject and take up another one. I think it is very pertinent and I will give my observations on it. Lots of people here will not agree with me and some may want to throw me out, but I am going to give them just the same.

I was so impressed with the idea of bringing the jaw bones together with wires to simplify the lip operation that I practiced it for a number of years, but when the children on whom I had operated started to come back ten and twelve years later, some of them had deformities that convinced me that

the operation was not a permissible one. I do not mean that only occurred in my cases, although I am only showing my own, but I see it in other people's cases. Bad deformities of the jaw result from wiring the jaws together and the orthodontist has a difficult time in correcting them. I have no way of telling which jaws are going to be deformed and which are not. I do not think anything in the operation has an effect on it. It is just a case of some jaws becoming deformed and others turning out quite normal.

A rather typical case came in of a child with the maxillary jaw very much contracted and the teeth of the mandibular jaw bending back, to say nothing of the loss of teeth. I find my orthodontic friends have a very difficult time correcting a case like that. The old idea was to mend the lip over the cleft with proper support. It can be done, and it does not give any deformity of the jaw. I wish to state firmly that I have never seen a case in which the lip had been mended over the jaw in these old cases, without any work on the bone at all, in which the teeth did not average just as good an occlusion as a normal jaw, with the exception of those teeth right around the cleft. In one case, at five months, the lip was mended over the cleft; less than a month later the cleft was closing; a little over two months later the cleft was almost closed; at eleven months (that is, six months later) the cleft was practically closed just by lip pressure, and a very much better relationship of the cleft is obtained by lip pressure than by any artificial means. Other methods are slower in closing up; they may go a year or so without closing.

That is an observation. I said I would give a series of observations. Here is another: where there is a cleft, whether the lip is repaired improperly or whether it is not repaired at all, the nose will lift to the opposite side and will be flat on the cleft side, and the nostril will be displaced backward on the cleft side. In the majority of children over three years of age it is impossible to get a perfect correction of the nose and lip by the simple ordinary operation, and the only way we have ever been able to get it is by splitting the columella and pushing this nostril forward, splitting the columella right straight in the midline and transferring that nostril as far forward as the one on the other side, as a preliminary to mending the lip. If you do not do it that way, then in order to do away with the flattening of the nose you must make a very much smaller nostril on the cleft side. In cases done this way the nose is almost symmetrical; none of these operations was ever perfect.

In some of the Brophy type of operation, not done by Brophy but by someone else, there may be shortening of the lip which follows retraction of the maxillary jaw. It is not a pleasant thing to have such patients come back to your office. You wish the angels had taken Willie before you got rid of him at the first operation, but they do come back and we have to devise some means of correction and have done it by cutting the cheeks loose and transferring them forward, cutting the columella from the septum, freeing the soft tissues from the cartilages, and moving them all forward and hanging them on the septum.

In doing this type of surgery, I have considered the patient's viewpoint.

If the patient is really unhappy and wants something that can be given him I think he is entitled to it. I think these are cases that you are interested in and I will tell you what we have been doing for them.

One boy had a peculiar retraction around the maxillary jaw; he objected to the drooping and falling in of the nose. There was a shortness of the maxillary jaw with a depression of the tip of the nose. By freeing the cheeks, cutting the columella from the septum and transferring all forward, we brought about a certain amount of correction, and whether it is better looking or not is a perfectly immaterial thing—it made him happy. One woman had a "dished" face and we transferred the tissues forward. It made her happy—that is all there is to it—there is no argument beyond that.

In some types of cases part of the columella cartilage will be found buried in the lip. If the side view is examined when the nose is pulled up, a hump in the middle of the lip, and a square prominence in the middle of the lip in the full face will be due to the lower edge of the columella cartilage which is buried in the lip.

There is another way of lifting the tissues forward; by transplanting cartilage between the lip and the bone, but I do not think it is as pliable as the other method. When the tip of the nose is involved, the temptation to put in cartilage is great, but it is not successful because it raises the bridge rather than the tip.

A man came in with a very short nose, partially due to a shortened lining. It may have been due to early syphilis, I do not know, but at any rate he had a little bit of a pug nose. He wanted something done in a hurry. We put a cartilage in. I do not think it improved his face at all but he thought so, and that was enough. It was as much as we could do in one operation but it is not the way to correct it. In order to correct that type of deformity the nose should be lengthened from the inside. The operation was done by transplanting a flap from the forehead into the inside of the nose, and the whole contour of the face from the lower lip up to the brow was changed by the plastic operation, which had not touched the bones in any way. The man was able to change his position from that of a laborer in a slaughterhouse to one equal to his mental capacity.

The craze about radium and x-ray, I think, is doing more harm than good. I do not mean that radium is not good, any more than I would say a knife is not good, but a knife in the hands of a reckless person and radium in the hands of a reckless person are equally bad. We have one case with loss of the nose, cheeks and lips from the injudicious use of radium.

I want to bring out the point that in making a nose there must be a foundation and that the bringing forward of the cheeks will help to build up the foundation.

Retraction of the part of the maxilla that supports the nose may cause very undesirable changes in the face, and the condition can be due to one of several causes, some of them having been already mentioned. In making the correction the foundation may either be pushed out with cartilage or pulled out by loosening the adjacent tissues from the maxilla and suturing them in a forward position. A dental prosthesis used after loosening the tissues and

deepening the sulcus by incision and lining the cavity with Thiersch grafts, has also been very helpful.

LINING OF THE MOUTH WHERE THERE ARE DEFECTS DUE TO VARIOUS CAUSES

I suppose you all know this, but I will say it again because I see it so often: the jaw bone will not develop past the time that the tooth buds are removed. If all the tooth buds are removed at the age of six, the patient will have a six year old jaw. One boy had about a nine year old jaw. A wax form was put in and covered with Thiersch grafts which changed the outline of his face, and a prosthesis fits down to the pocket and holds the chin forward. A woman (and this is a dental sin) had a tooth extracted in the acute inflammatory stages. I see a lot of these cases. She had a loss of bone and cheek. A flap from the neck and a Thiersch graft gave restoration. The cheeks filled out because she is now carrying a complete upper and lower denture. Before the operation she could not open her mouth at all; now she can open her mouth and chew. Wax forms carried the Thiersch graft which was implanted to give perfect freedom of the cheeks. There are a number of cases which can be helped by the Thiersch graft transplanted in the mouth. In another case a large section of the lower part of a man's cheek and jaw was taken out for cancer and a flap was transplanted from the forehead to give both lining and covering. It was a quick result but did not look well, but the patient is wearing a prosthesis in the pockets that were made; he is a laborer, eating a laborer's food, earning a laborer's wages and taking care of his family, and he is satisfied; he is practical. One can do cancer surgery if he knows he can make the restoration. You can cure these people if you make a big enough destruction. Another girl had the teeth and jaw bone removed for a necrosis. The jaw bone was removed three weeks after the teeth were infected, so we know that she should not have been operated upon then. As a result, the patient lost most of her jaw bone, and as a result of losing the jaw bone the facial tissues did not develop. We took a flap from the forehead for the covering, and one from the neck to line the sulcus, and undertook to plant a prosthesis. The flap put in under the chin and the lining put on the inside have brought the chin forward. The patient is not a good mental type, and she would never wear a prosthesis made by Dr. Brown.

Dr. Silverman, in opening this discussion, spoke about certain knowledge that I have absorbed from the dentist. I think I can say rather truthfully that I never seriously studied a dental book in my life for an hour, but I never studied any kind of book. I always went to someone who knew about the subject I was studying and asked him questions. I have asked questions of dentists all my life and that is how I have obtained my dental knowledge.

My final conclusion is that there is no difference between the principles of surgery, the principles of medicine, and the principles of dentistry. They are all the same. I believe that the human race has been very much handicapped in the past by a lack of cooperation between dentists and surgeons, that each has not known enough about the other man's work. I believe further that there are a great many of these cases that either one can carry

so far, but at a certain point he must turn them over to the other man; that is, the one man can represent the two sides—I do not mean one man cannot do the two sides, but unless he has both sides of the thing he can only carry it a certain distance.

As a result of these observations I have had a very strong feeling that the dental students who graduate from a school in which dental and medical teaching are coordinated, have a tremendous advantage over the dentists who have had only dental training, because the time has come when the medical profession looks to the dentist for consultation and for cooperation. The young man who has a little knowledge of medicine, and who can understand what the medical man is talking about, is going to progress more rapidly than the dentist who is unable to interpret to the medical man what he is trying to find out. The medical practitioner does not know; he wants to be told. The fact that I have been able to pick up points from dentists and get along a little farther than somebody else just proves the fact that the dentist who can understand a little of the medical viewpoint is going to get along farther than the dentist who has not that knowledge.

INTRODUCTION AND DISCUSSION

President Howard.—I have the pleasure of introducing to you Dr. S. L. Silverman, of Atlanta, one of our leading oral surgeons of the Southeast, who will present to you the speaker of the evening.

Dr. S. L. Silverman.—To every dental, oral and general surgeon who as much as wielded a scalpel, a rongeur forceps, or any other instrument about the jaws, the name of Blair is well known, his teachings followed and respected.

During the World War, the surgeon-general turned over the subsection on plastic and oral surgery to the essayist of the evening, and gave it not another thought, knowing full well that all was safe in his hands.

The subject that he has chosen for this evening is often the cause of arguments as to whether it is in the domain of orthodontia or whether it belongs to oral surgery. Let me say this: No surgeon would ever attempt to correct a retruding or protruding mandible unless he had first exhausted every bit of orthodontic talent available. If he ever dares to operate upon a case of this character, which oftentimes may result in infection, he will only do so once, because the trying experience through which he will have to go, and his patient as well, will wring all his enthusiasm out of him, and the alacrity with which he will approach his second case will compare favorably with the motions of a snail as shown by the ultra-rapid camera. It may be that experience has taught me that surgical interference with jaw deformities should come last, rather than first.

Most physicians and dentists are of the opinion that Dr. Blair holds a D.D.S. degree as well as an M.D. That is incorrect, and to visit his clinics and to talk with him, one marvels at how much of dentistry he has absorbed, proving to all cantankerous ones that assiduous study and application is what qualifies one to do a certain class of work, and not multiplicity of degrees.

Most of you knew or heard of the recent Dr. Frank Holland of this city. He did not have a D.D.S. degree; he only had an M.D. degree, yet if there was a better dentist in this world than he was, I cannot now recall his name.

The delvings into dentistry that the essayist has made have been very fruitful. He has learned and appreciates, for instance, that the orthodontist alone is capable of replacing the stumps of jaws in their normal relation after the loss of some structure about the face, due either to injury or disease. He knows, too, that the prosthetic dentist is the only one capable of reproducing the maxillary bones when lost by disease or injury. He knows, too, as a plastic surgeon that rhinoplasty is very much better than an artificial nose, if it is at all possible to do a surgical restoration of the nose. And, finally, he

knows that in extensive injuries about the face and jaws, where patients have suffered the loss of eyes, nose, lips, including upper and lower jaws, this great woman sculptor of Boston, Mrs. Laird, has a method that was used in nearly a hundred cases wherein she recreated the features that were lost by an electrodepositing method resulting in a mask that served, and serves, to hide the horrible mutilations.

So we are to hear from one whose opinions are well seasoned, and whose views are authoritative. I take great pleasure in introducing Dr. V. P. Blair, of St. Louis.

President Howard.—It is needless for me to say, I feel sure you will all agree, that this is the most remarkable demonstration of plastic surgery that we have ever seen.

None of you have had the opportunity of reading before tonight the paper prepared by Dr. Blair and no one is down to open the discussion. However, Dr. Pullen has consented to open the discussion under those circumstances. He is not an oral surgeon. Let me say before calling on Dr. Pullen that there are a good many men here in the dental profession, and I think several who are in the medical profession, who are not members of the American Society of Orthodontists. The courtesy of the floor is extended to those people most wholeheartedly.

Dr. H. A. Pullen.—Ever since I arrived I have been asked to open something. It has usually been a bottle. It would be much easier for me to open a bottle than to open a discussion on a subject about which I know so little.

I asked one of the ladies before I came in if she would not like to come in to this meeting because a gentleman was going to tell us how to cut up. She said, "He can't tell me how to cut up." And she is the wife of one of our most conservative members.

The president asked if I would give a short discussion on Dr. Blair's paper. I said it would have to be short, because I did not know anything about it, and after hearing the paper and realizing how little I do know about the surgical correction of malrelations of the jaw, I feel very much like the schoolboy who with others was asked by the teacher to write a short essay on baseball. He was the first one to hand in his essay. The teacher received it and she read as follows: "Rain—No game."

I have always thought that in our most deforming mandibular protractions—mesioclussions or mandibular prognathisms (please note the terminology)—there were conditions where orthodontic correction ceased and surgery began, like the little boy who never liked to wash his face, to say nothing of washing his neck. One day he was sent to the bathroom to wash his face and neck, and he inquired of his mother, "Ma, where does my face end and my neck begin?"

In these types of deformities which Dr. Blair has shown, surgical correction surely seems advisable, and I have no doubt but that the technic of the operations as worked out by Dr. Blair is the last word on the subject.

There are some cases which Dr. Blair shows in his book which he has not shown this evening, which might particularly interest the orthodontist, and which have particularly interested the orthodontist. I refer to the cases of the openbite and the obtuse angle of the mandible, the technic for the correction of which has been carefully worked out by such men as Dr. Blair.

The cases which he has shown us this evening seem to me to be almost entirely new to the realm of surgery with which we are familiar. Dr. Blair is enabled to give wonderfully pleasing facial appearances to these cases, and to give to these individuals personalities of which they have been robbed by circumstance, by heredity, environment, trauma or other conditions.

There is no question as to the necessity and value of early surgical procedure in harelip and cleft palate in many cases, and many of you had the valuable assistance of Dr. Blair in the treatment of such cases.

The ankylosed cases which he has shown are wonderful.

Dr. Silverman said that Dr. Blair had only an M.D. degree. Yes, but that stands for something.

I am reminded of a story that is told about Chauncey Olcott when he was a boy at school. When the bill for the school expenses came home to his mother she read it over carefully and she wrote Chauncey a letter. She told him that she was so grateful that

he was giving some money to the Society for the Propagation of the Gospel. She had found in the bill of expenses the abbreviation S. P. G. She took it for granted, of course, that it meant the Society for Propagation of the Gospel. Chauncey was too honest to let this go by so he wrote to his mother and told her that the letters stood for "something, probably grub."

Dr. Blair has given us many new thoughts. One in particular, which I jotted down, was that the mandibular joint is not a necessity. I noted, however, the sex of the patient. It was a girl.

I have a patient now who has a chinless face, and he has been begging me to let him undergo one of these operations for some time. I thought I would look carefully into the results of Dr. Blair's treatment and see if it would not be a wise thing for him to go to St. Louis and have a piece of cartilage put on his chin. He says he is tired of having people who sit next to him in the moving pictures say, "Who is that chinless man?"

Perhaps these cases might be treated with a piece of cartilage in some such way as has been shown here tonight, some of our after treatments, so to speak, of distoclusion or protraction, mandibular retroversion, and so forth.

Dr. Blair is getting down to earth when he speaks of lip pressure in these harelip cases, when he speaks of sewing up the lip, the harelip first, and getting normal use of the lip, and correcting to a certain extent the cleft. That certainly is a new thought to us, and a very, very interesting one. It has many possibilities in treatment.

After seeing all the facial deformities impossible of description which Dr. Blair has shown, I believe that even Dr. Hellman will find it different to suggest a nomenclature or terminology which will describe the facial deformities shown. Perhaps there may be terms which would describe them, but we have all forgotten them, so to speak. It reminds me of the German visitor to the Congressional Library in Washington. When he came out of the building some one asked him, "How do you like it?"

"Well," he said, "there is only one word in the English language to describe it, and I have forgotten that word."

I do not know that I have thrown any light on the subject that Dr. Blair has been talking about. We do know that we have got something out of his enlightening and constructive presentation.

I am reminded of a man who was visiting a friend who lived on a farm. He happened to stroll out in the woodshed one night about twilight and he saw the hired man cleaning a lantern. "What are you going to do with that lantern?" he asked.

"Going to call on my girl," was the reply.

"Who ever heard of calling on a girl with a lantern?" he said. "Why, when I courted my wife I never carried a lantern."

"Well," the fellow replied, "see what you got."

I am sure that I voice the sentiment of every member of this society when I say that we are indebted to the essayist far more than mere words can express, for a very instructive and interesting presentation, and we are continually indebted to him for all the wonderful and beautiful reconstructive work which he is doing and will do for afflicted humanity.

President Howard.—I stated at the beginning of this meeting that I would not call on any one directly, after the opening discussion, but we have with us tonight a man whom we all know, who is not, you might say in a sense, an orthodontist, but who understands not only the fundamental principles of orthodontia but who also understands and practices oral surgery. I am going to call on Dr. T. P. Hinman to say a few words to us.

Dr. T. P. Hinman.—It was really a treat to hear what Dr. Blair had to say, and more of a treat to see the wonderful work that he has done in these most distressing conditions that confront us who are attempting to do something for humanity from the oral surgical standpoint.

There are three things that I would like to ask him because they have distressed me not a little in the last few years, for the reason that I have always had so much trouble in producing the cosmetic condition of the face after a previous operation had proved a failure.

My first question is with regard to the retrusion of the anterior portion of the maxilla, due to a badly done harelip, where there was no lateral loosening of the cheek tissues. If you have seen these distressing cases (and Dr. Blair showed a few tonight) you can appreciate just what the child and parents have to endure.

My observation has been that all retrusions in the single harelip cases in the anterior portion of the maxillary bones have been due to a lack of loosening the cheek laterally and the use of tension sutures in drawing the lip over. If I may make myself a little more clear, I would say that any harelip, whether it be double or single, that is operated without a complete loosening of the tissues so that the lines of incision will coapt without tension will result in retrusion of the anterior portion of the maxillary bones.

In an active practice of something over twenty-four or twenty-five years (I mean in oral surgery) there has been one other very distressing thing that has been presented numerous times, and that is a condition that supervenes after a surgeon has removed the intermaxillary bone completely and has closed the harelip. I have never seen any plastic operation that would restore the mouth and bring the features back to a reasonably cosmetic condition.

The third question: It has been my observation that in cases operated upon in infancy in which the lip only was operated on, that the maxillary bones come into position, the fissure or gap closed, but the operation was done in such a manner as to produce a retrusion of the anterior portion of the maxillary bones.

If this operation is done before the teeth erupt, and the face, nose and lip are brought into as close alignment as possible, certain cases will narrow; that is, the cleft will narrow, but there will be no union of the bony tissue.

If I am clear in my observation, Dr. Blair seems to rather question the advisability of what is known as the Brophy operation. Dr. Blair is perfectly familiar with Dr. Brophy's technic, I am quite sure, and he has made some modifications of it which it is not necessary to discuss at this time.

My observation of the Brophy operation, ranging over a period of some twenty-five years, has been that when it is done correctly (which is rarely accomplished) the results justify the means used.

The difficulty in this operation is due to one error which is very common, and that is the placing of the wires too low and near the alveolar process, and going in through the tooth buds.

Again, very few men have attained the skill necessary to do this peculiar operation, and no one has been able to accomplish quite the results that Dr. Brophy has, it seems to me.

If we can, by any means, abandon this operation, and by closing the lips reduce the size of the cleft and get a closure of the cleft, we should do it, but my observation has been that this, as a rule, is not a successful procedure. These things are very interesting to me, and I am sure that Dr. Blair will be able to throw a great deal of light on the subject.

From the orthodontic standpoint, I have seen numerous cases badly operated upon, in which there was a noticeable constriction of the maxillary bones, where the teeth buds were somewhat disturbed. The orthodontist has been able by his skill to restore the arch to a reasonable state of normalcy, and orthodontists have accomplished wonders in their specialty.

I remember distinctly thirty-five years ago when I first began to practice, how we attempted to straighten teeth. We knew nothing of orthodontia. It was not an exact science. It reminds me very much of a student who happened to be a senior about thirty years ago when I was attempting to teach orthodontia. In the final examination I asked him the question, "What two types of force are used in regulating teeth?" I expected him to say the intermittent and the continuous, but being somewhat ignorant of the subject he said, "Push and shove."

That is about all we did thirty or forty years ago.

I want at this time to say to you gentlemen that it has been a great pleasure to have you amongst us. We have no latchstring. If we did, it would be on the outside. There is no lock on the door and we want you to come again.

President Howard.—I have had two types of cases that have been operated on for the correction of malplacement of teeth. In both cases, there was an extreme amount of scar tissue. I might say that these cases were not done in Atlanta. At any rate, my mistake was in believing I could correct that. In other words, the anterior teeth were retruding.

It was easy enough, through mechanical appliances, to place those teeth back in fairly vertical positions, and even to carry them forward and obtain an overbite, but the natural thing that I should have expected certainly happened, and that is there was no way to hold them there. This tight scar tissue carried them immediately back, regardless of inclined plane or any other locking process.

I have made that mistake twice. Probably somebody else has, too, but I will not make it any more.

Who else wishes to discuss this paper? Perhaps there are some questions you would like to ask.

Dr. T. T. Moore.—I would like to ask Dr. Blair if it is usual in these cleft-palate cases to find the presence of supernumerary teeth.

In two cases which I have had for postoperative treatment I have found from three to four supernumerary teeth. I would like him to say a word on that subject.

President Howard.—Any further discussion?

Dr. H. C. Pollock.—I had not intended to discuss this paper, but on account of my geographic location I have known for a good many years (and I do not know that it is generally understood) that Dr. Blair knows a great deal about the establishing and advancement of the science of orthodontia.

Dr. Blair was active at the time that Dr. Angle was active in St. Louis years ago. I know there were many conferences over the difficulties of Dr. Angle at that time, on account of some talks that I have had with Dr. Blair.

He has admitted here this evening that he has spent a great deal of time in interviewing the dental profession in years gone by. I wondered at the time that if he realized that while he was interviewing the dental profession they were interviewing him at the same time, and that he is here for that purpose this evening. I know he has a great deal of information that would be of interest to the orthodontist, some that he has not touched upon this evening.

He made a suggestion not very many weeks ago something like this: He said, as nearly as I can remember, "You orthodontists straighten teeth and you shift teeth about; and you correct these malpositions. You know, my surgeon's training and observation of the activity of the muscles and bone, the ligaments, and how they will reconstruct themselves, teaches me that if I were an orthodontist and I wanted to correct one of those deformities of what we call Class II, Division 1, aside from receding lower jaw, I would throw that lower jaw clear out beyond the upper and hold it there until these muscles and ligaments and bones had adapted themselves to that position, and then would let them go back or correct them back, so to speak."

A surgeon's idea of that character to an orthodontist at first seems more or less radical, as he has been trained in the past to think only of the teeth, but nevertheless there is some food for thought in the suggestion, and I have tried that very thing. And while it has not gone through to the conclusion by any means, I believe it is worthy of some merit.

I would like to hear Dr. Blair discuss that question in closing the discussion this evening, that is, in regard to the adaptability of muscles and ligaments to a new position in which a mandible might be placed. I know he has had a great deal of experience along that line, and inasmuch as that matter was discussed so vigorously at the meeting—the question of skidding teeth, as it were, over the alveolar process, or bringing the mandible forward—I would like to hear his views on it.

President Howard.—There is a new thought. It makes a Class III out of a Class II, Division 1.

Does anybody else wish to discuss the subject?

Dr. G. W. Grieve.—I would like to ask Dr. Blair two or three questions.

Did I understand you, Dr. Blair, to say that in the treatment of some of those ankylosed cases you dragged forward the mandible and wired it in some way to the maxilla? That is what I understood you to say. We saw what an improvement it made in the appearance of the face, from the increased size of the mandible. If I understood you correctly, you said afterwards that you had found it to be a failure. That is the interpretation I obtained of what you said. The idea of bringing the mandible forward in that way, after having severed the condyles, was new to me, and as I have had experience in treating one or two of those cases, from an orthodontic standpoint, it was of very great interest. Two cases which I have in mind were young ladies between twenty and thirty years of age, and while there was good action of the mandible after the surgeon had completed his work, there was no increase in its size.

I would like to ask, if you would give us some information concerning another type of case which is somewhat similar, in that there is a contraction of the ligaments, whereby the mandible is drawn off to one side, and you have what seems to be almost an ankylosis, with very little possibility of the patient separating the mandibular from the maxillary teeth.

I would also like to ask Dr. Blair, his opinion as to the advisability of decreasing, surgically, the size of the tongue in those cases of Class III where that organ is so large that it has pushed the mandibular teeth and process forward to such an extent that were we, as orthodontists, to attempt to curtail the space for the tongue, the latter would only push forward the whole structure again. I have heard of the possibility of taking a "v" from such a tongue, of a shape to be governed by the change of form desired, as to whether it is to be shortened or narrowed, or a combination of both. I would like to ask Dr. Blair if he has done anything along that line, and if he considers it a practical thing to do, what effect it has upon articulation, and whether it would be considered wise, in extreme cases of this type, from an esthetic standpoint, to perform such a radical operation.

President Howard.—Does any one else wish to discuss this subject? Dr. Kelsey—you do not have to reply unless you want to, but you have done some work on ankylosed cases that you have reported. Would you be kind enough to discuss this?

Dr. H. E. Kelsey.—I have only a very few words to say, but I am very glad to say those few words, inasmuch as I had the opportunity at one time of witnessing an operation of Dr. Blair's on a patient of mine, and saw the wonderful skill with which he conducted this case.

I have been interested, it is true, in the reparative work of cases after cleft-palate operations have been performed, and Dr. Blair's talk tonight has been quite a revelation to me regarding the plastic surgery aspect.

The operation which Dr. Blair performed was a flap operation inside of the mouth. The object was to close a cleft which had become impossible to close otherwise, through loss of tissue from frequent previous operations, often followed by infection and sloughing, and I am very glad to report that it was very successful and has been a wonderful thing for the patient. I followed the orthodontic work up afterwards as long as the patient was in my hands, and then referred him to another man in another city.

I was more than pleased, I was amazed, at the results that Dr. Blair showed on the screen in plastic surgery. We certainly should be thankful to anybody who can produce this work on the outside of the face to supplement the work which we have to do on the inside.

In regard to the ankylosis cases, I can only say that I have struggled with a number of them in which the jaw has been released through an operation, and that they have responded to orthodontic treatment in a similar manner to cases in which the maxilla has been limited in its development by other causes.

I can only add that I have had a great deal of pleasure in listening to Dr. Blair and I will be very glad indeed to see the report that he has made published.

President Howard.—Does anybody else wish to discuss this? We will close the discussion if there are no other questions. Dr. Blair, will you close it, please?

Dr. V. P. Blair.—I knew I was stepping on a hook when I mentioned that wiring of the maxilla. I started out by saying that I was going to show you a series of observations, and that is all I am doing; I am not telling you what to do; I am just showing you some of my observations. I will repeat my observations about the cleft, wiring, and closure by lip pressure. In the first place, closure by the lip pressure is the original manner of doing it. That was the original plan, which probably reached a very high stage of development in the first quarter of the nineteenth century. At that time we understood perfectly the idea of drawing the cleft together by putting appliances with jackscrews on the teeth to pull them together.

I have never seen the late bone deformities following operations on the soft tissue alone, but I have seen very great deformities following either the forceful approximation and wiring of the maxillae or cutting the maxillae with a chisel. The slight mesial occlusion of the upper incisors that often follows lip operation can usually be corrected in three weeks, though retention splint must be worn longer, but I have seen a number of cases where the exaggerated displacement following wiring of the bone has not been corrected in three or four years of active treatment.

While I was particular in the narrow relation cases to show only my own cases, I have seen them from other people and from people recognized as being the highest authorities in this type of work. I have a slide that was not put in that series I showed you. I am sorry it was not put in, because it is very instructive. I will say this about it: the case was operated on by Dr. Brophy. It answered a point in contention. The contention is that unless the bones are brought to their proper relationship, you cannot restore the relationship of the ala to the columella. And I think probably the converse is supposed to be true: that restoring the relationship of the bone to mending the lip will give the proper relationship to the ala and to the columella. That is not my observation.

My observation has been (and it is based on a great many cases over a long period of time) that the relation of the bones has absolutely nothing to do with the nasal deformity; that in a perfect palate and a perfect alveolar cleft that has no alveolar arch (it has no cleft in it at all), unless the lip is repaired properly and the correct relationship between the ala and the columella is restored, the typical nasal deformities will persist and develop, whether you have a cleft palate or not. That was my observation.

Some time this winter—perhaps I cannot describe it exactly, but I can give you an idea—a boy came in who had been operated on by Dr. Brophy. We will say the cleft was on the right side and that his left maxillary central incisor was brought over until it was in contact with the mandibular right canine; that is, it was brought past the midline. Yet the patient had the typical nasal deformity that one has with a harelip, that spreading of the nostril. That is, the bringing together of the premaxilla past the midline had not corrected the deviation of the nose away from the cleft.

So I simply repeat my conclusions: that the cleft in the alveolar process has nothing to do with the nasal deformity; that the nasal deformity can be corrected without closing the cleft in the alveolar process; and that the closing of the cleft in the alveolar process will not correct the nasal deformity; that they are, apparently, two absolutely distinct and separate things when it comes to the surgery of them.

Dr. Hinman asked me several questions. There is nobody who can interest me more than Dr. Hinman.

I did not say there were not people who could do that operation in a certain way, but my observation is that it is a dangerous operation.

Dr. Hinman said that he thought the damage was done by placing the wires at too low a level. While I have abandoned the operation entirely and never expect to do it again, I think he will remember (and he hinted at it here) that I recommend, in doing the operation, that the wires be passed through the orbit, because I called attention to the fact that the distance between the floor of the orbit and the roof of the molar tooth bud (that is, the bone lying between the tooth bud and the orbit) is less than the thickness of a piece of blotting paper, and it is perfectly impossible to put a wire through there without going through the orbit or through the tooth bud. It cannot be done. You just take a section, and you will see that it cannot be done.

In the cases which I have shown you, I have put the wires through the orbit, so it was not the low wire that did it. I may have pushed them too hard, or pulled too hard, or something of that kind, but I obtained those poor results, and I think that I can get good results in another way.

As regards the misplaced premaxilla; if that premaxilla is pushed back too far the teeth incline backward toward the pharynx, which is a difficult thing for an orthodontist to deal with. I know it is, because I have seen orthodontists struggle with it. It did not worry me much because I was not doing it. They were doing it and I rather enjoyed it.

I will give two answers to Dr. Hinman's questions. One is that if a premaxilla that has been operated upon is giving too much trouble, I think one can either remove it or take the teeth out of it and anchor it in place, then free the lips, either by implanting a skin-graft under the lip, or better still, by freeing the cheeks and transplanting the tissues forward and sewing more mucous membrane as you carry it forward.

I do not know whether you can catch that point or not but I will try to explain it to you. If you will start at one molar tooth and free the cheek up to the floor of the orbit, cut the alae from their attachment to the maxilla, cut the lining, mucous membrane from the saddle-cartilages, so that the cartilages are cut free from the lower borders of the nasal bones, push in an elevator and separate the skin from the saddle-cartilages, cut across the floor of the nostrils, make a cut between the columella and the lower border of the septum, then you can pick up the nose, the lip and the cheek and carry them forward. You can carry them an inch forward, after doing all of that, probably not an inch, but you can carry them well forward. Then start in by putting a suture between the columella and the lower border of your septum, but put it in such a way that it transplants the columella forward, say, a quarter of an inch; or you can move it almost a centimeter before you obstruct the nostrils in some cases. Having pulled that forward, the lip will follow it. You are hanging the columella on the lower border of the septum. The lip follows it forward. Make a little cut upwards in the mucous membrane of the cheek, opposite each molar tooth. When you do that, then you can pull your mucous membrane together in the midline, so that you can make a wall of mucous membrane traveling forward from the gum to the lip, increasing the space, that is, between the premaxilla and the lip. That lets the lip come forward.

I have come to the conclusion that rather than give orthodontic treatment in a lot of these cases, it is better to pull out those small teeth that are in bad position, and make a plate for the child. That idea was given to me by a dentist when a child five years old came along wearing a plate, or trying to wear a plate, in which the lip was pulled back, attached to the premaxilla. I caught the idea from the dentist. We freed the lip from the premaxilla, had another plate made, and the child wore it in perfect restoration.

My present belief is that a much better result in these exaggerated cases will be obtained by expanding the molars and premolars laterally, advancing the lip and cheeks, and then extracting the anterior teeth and replacing them with a prosthesis.

About the bony closure of the cleft, I think in a single cleft, it is immaterial. In a double cleft, it is a necessity, and you can get your bony closure at any time by cutting away all of the mucous membrane and periosteum and keeping the bones in contact. I think you will get your bony union in that way, but in single cleft I do not see the necessity of it.

I do not think I have answered all of Dr. Hinman's questions, and I think we could talk over that problem for a week perfectly comfortably and still be at it.

With regard to the question about supernumerary teeth, they are very common in these cases of clefts, and I think probably it is due to the fact that the cleft gives more room to grow teeth, just as in a cleft lip you have a greater extent of the vermillion border; that is, the vermillion border carries up and lines the cleft, and there is no reason why, apparently, the mucous membrane lining the cleft of the alveolar process should not carry part of the dental strands. It is not an uncommon thing at all in the young baby to see tooth buds sticking out from the side of the cleft in the alveolar process, and later you have these supernumerary teeth developing.

For years, I have been thinking over that problem which Dr. Pollock presented to

you and if I could pick out the right lantern slide I think I could show you the answer to it. I will, however, describe the case to you.

A child at twelve years of age had both condyles removed. The jaw was dragged forward until the mandibular teeth were about a quarter of an inch in front of the maxillary teeth. They were kept that way for twelve weeks. At the end of twelve weeks there was no tendency for the jaw to drop back apparently. Then I sent the patient to an orthodontist—perhaps he was just a plain dentist, I do not know—with the suggestion that he take out the second premolar on each side; or maybe it was the first—I have forgotten which; anyway, it was one or the other. He carried out my suggestion and then put a band on there that drew the canines and incisors backward, until he closed the space from which the premolars had been taken out.

The teeth had been protruding forward a little bit in front. When the treatment was finished, he had established a good relationship of the incisors and the molars were forward the space of this premolar. I know that has been retained because the patient has kept exactly the same relationship of her incisors ever since.

If we could get that result by cutting out the condyles, I cannot see why we do not get the same result without cutting out the condyles, but by simply taking and dragging the jaw forward. I can push my jaw forward a full centimeter, and I do not see why, if that jaw were dragged forward and held there, it would not be a means of correcting some of these retreating jaws. I do not think that the correction that is obtained (those that I have observed) from purely orthodontic appliances have always been satisfactory. The teeth are brought forward, but the chin remains behind, and we have to put a cartilage in there to bring the chin forward.

I think I was misunderstood when I said I had abandoned that method of bringing the jaw forward. I have found it extremely satisfactory, and used it in several cases in which I had immediately dragged it forward and wired it in place and then turned it over to an orthodontist. Drs. Williams and Pollock took care of one of those cases; Rupp's School took care of another one that I remember. A rubber band was put on going from above downward and backward, just kept a little pull; and was worn (I think three weeks will do it) for about three months, to be sure of it. And the jaw stays in place when treated that way. Incidentally, they shift the teeth around so as to get better occlusion of the cusps.

No, I think that is a good procedure and I think we will stick to it for a while longer.

In cases of persons twenty and thirty years of age, you will get better results by subcutaneously sawing the ramus in two with a wire saw than by any other sort of orthodontic appliance. The only objection to that operation that I can see, which can't be advanced against any other kind of operation, is that you do cut the nerve in two. I have never seen any evil results following it, and eventually, apparently, the nerve is restored. At least, I occasionally see several cases which I did years ago and they have good sensation in the teeth.

With regard to cutting out a piece of the tongue, I am sorry that nobody commented on that case I showed of an old woman having the whole shape of the jaw changed after cutting out the tongue, and I have observed that a number of times. Conversely, one would expect the tongue to hold the teeth forward, if it were too large.

I can see no objection at all to cutting out a pie-shaped piece of the tongue. I do it often for little growths. Some of them, when they are early, distinct cancers, we cut out. The free edge that we cut out might be seven centimeters of tongue around. I mean, the border. You can cut out seven centimeters of a border of tongue, a pie-shaped cut, going way back to the median septum, sew it together, and unless it is a very remarkable person I think in three months you won't be able to find where that had been cut out.

So there is no possible objection to cutting out a section of the tongue, if you think that it is interfering with your orthodontic work.

President Howard.—Dr. Blair, I am sure that I make no mistake when I tell you that the members present and guests sincerely appreciate the wonderful presentation you have made of this subject and we thank you for it.

DEPARTMENT OF DENTAL AND ORAL RADIOGRAPHY

Edited By

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and Howard R. Raper, D.D.S., F.A.C.D.

IMPORTANCE OF A THOROUGH X-RAY EXAMINATION BEFORE TREATMENT*

By J. A. GORMAN, D.D.S., NEW ORLEANS

MODERN engineers make a thorough examination and study of the territory before they place a structure and its foundation. As modern orthodontists why do not we do likewise? Time has passed (now that we know what the x-ray reveals) when we can depend entirely on an examina-



Fig. 1.—Case 1. Girl eight years of age. Notice approximal cavities between the two deciduous molars on the right; and on the left, between the deciduous and first permanent molar, you will find two cavities.

tion of the model alone for a thorough diagnosis of a case. We must go deeper into our study of each case and ask ourselves if there are any supernumeraries or impacted teeth; any faulty fillings; any devitalized teeth or diseased areas; any cavities not noticed with explorers or floss tape. Then last of all but by no means least, if the case be one of mixed denture; are there any missing tooth germs or diseased deciduous teeth? The use of the x-ray should be our first thought after making models of the case, and there should be a full set of pictures for I do not see how any one can ever give an intelligent diagnosis without them. It is our duty as a means of protection and to save us *much* embarrassment later when we have some of

*Read before the Twenty-fifth Annual Meeting of the American Society of Orthodontists held at Atlanta, Ga., April 14-17, 1925.

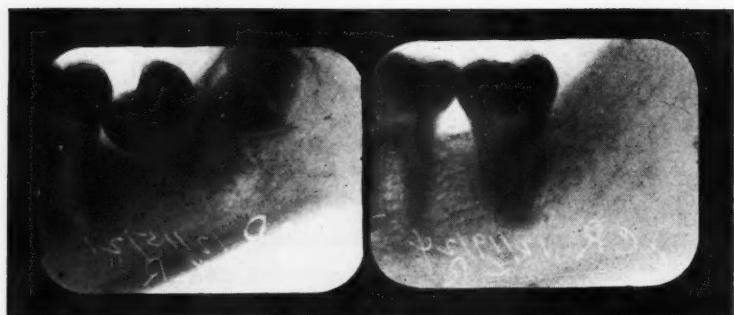


Fig. 2-A.



11 years

12 years

14 years

Fig. 2-B.

Fig. 2.—Case 2. X-ray, right and left, same patient. Began treatment at eleven years of age. Notice crowns of both mandibular third molars well formed and impacted. (a) On right side, second molar also impacted. Had right third removed and the second tipped back.

(b) Same case at 15 years of age. Second molar in place, and on left side, third molar was not removed until patient was 15 years of age.

Note how it has developed and how it has become impacted. Ages 11, 12, and 14 years.



Fig. 3.—Case 3. X-rays of child ten years of age showing the following teeth missing: The four second premolars, as well as the maxillary right first premolar. The child still had the maxillary right and mandibular left second deciduous molars. Note the cavity in the left mandibular deciduous molar.

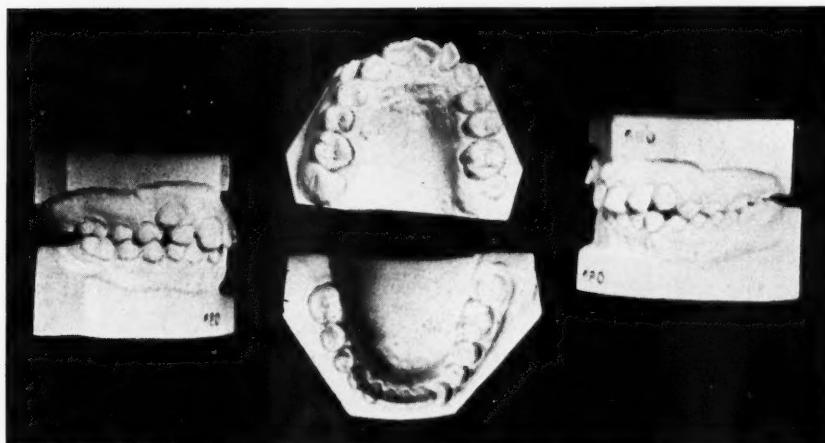


Fig. 4.—Case 4. Photo of model of girl 14 years of age and x-rays of right maxilla and right mandible, showing the second and third molars below, and the third molar above, missing; while on the left, both the maxillary and mandibular third molars are missing. Never had any extractions.



Fig. 5.—Case 5. Boy eleven years of age. Both mandibular canines missing, and no previous extractions.

these truths revealed to us while treating our cases; or worse after they have been dismissed. I have been fully convinced for years of the importance of the x-ray in orthodontia and I will prove this to you later with slides. Last fall in Dallas at the meeting of the American Dental Association at which time I heard Dr. Raper's paper on "The Five Films Examination for Preventive Dentistry," and also read his articles in the INTERNATIONAL JOURNAL OF ORTHODONTIA, ORAL SURGERY AND RADIOGRAPHY, February and March, 1925, on the same subject. He says that Dr. C. O. Simpson called his attention to the fact that proximal decalcification can be detected before any actual cavity exists so it behooves us to watch out for these defects and record all cavities, as the orthodontic appliances today are blamed both by the dental profession and the laymen as being the cause of so many decaying teeth. I cannot refrain from quoting the words of Dr. C. N. Johnson in

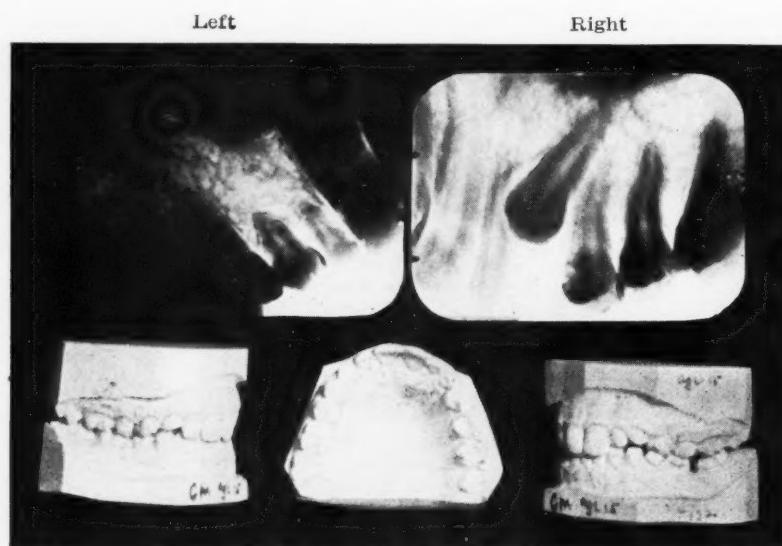


Fig. 6.—Case 6. Study models and x-rays of girl 15 years of age, showing canine and lateral on left maxilla missing, while canine on right mandible is slightly impacted.

Dr. Raper's paper: "To detect cavities and fill them when they are small does something more than limit the decay in the teeth thus treated. It lessens the tendency to decay in other teeth in the same mouth." In reading the negatives one should study every shadow and always be on the alert because these decalcified spots appear on the negatives as a radiolucent (dark) area so care must be taken not to mistake the normal radiolucency of the tooth structure for a cavity. Delicate cement fillings cast so little shadow that one must not mistake them for cavities but the shape will determine these as well as the clinical evidence.

In regard to the five film examinations or the cross section of the crown, Dr. Raper is working on a film holder and the Eastman Kodak Company is making some changes in the sizes of their films after his suggestion. These will shortly be on the market.

As for supernumeraries, I have found them everywhere from between the centrals and as far back as maxillary and mandibular fourth molars and

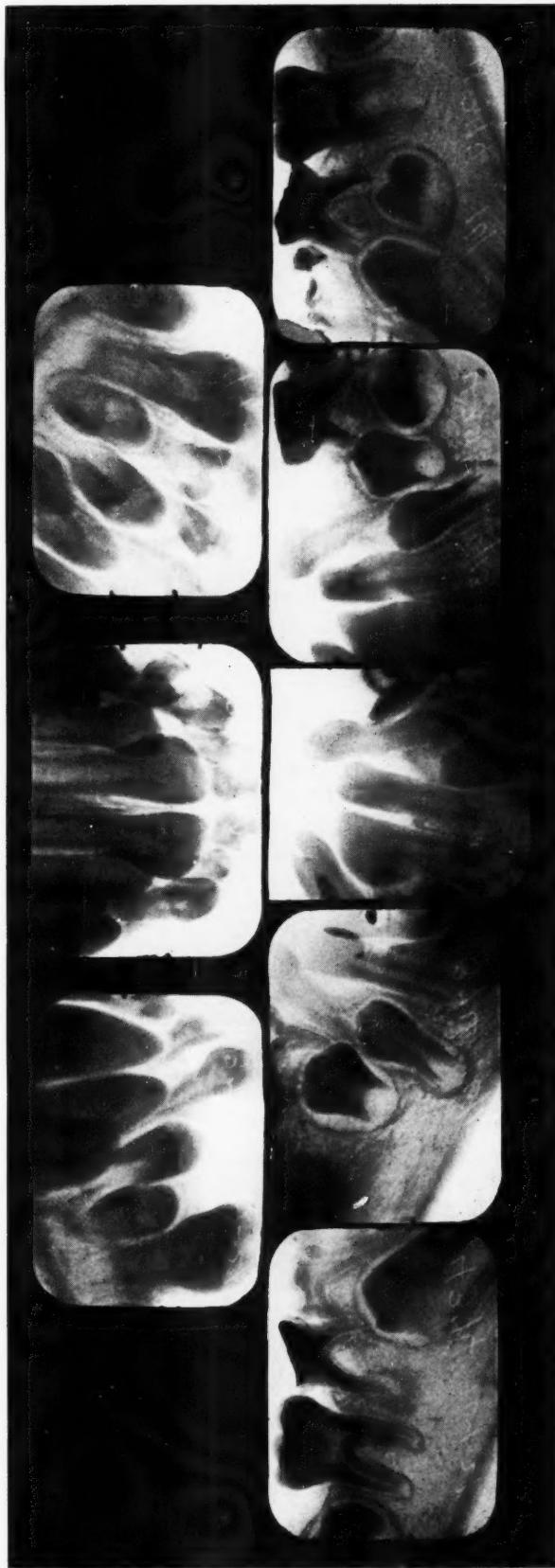


Fig. 7.—Case 7. Full set of films of boy seven years of age. In the mandibular arch three permanent teeth are missing, as follows: Mandibular left, second premolar, and both mandibular canines. The laterals were malformed.

all the way from one to as many as nine in the one area, so I am never surprised at anything about them as to size, number or position.

The same is almost my views of missing teeth, as I have found them missing where we least expect but the most common places are: the maxillary laterals, and mandibular second premolars; still I have found missing canines, maxillary and mandibular, under perfectly good deciduous teeth. And I have also found missing the second and third molars in the same mouth. I have three patients who are sisters: The youngest has eighteen permanent teeth missing; the next older has twelve missing and the eldest has one missing.

As for impacted teeth, it has been my misfortune or good luck to discover centrals, canines, premolars, as well as second and third molars, but

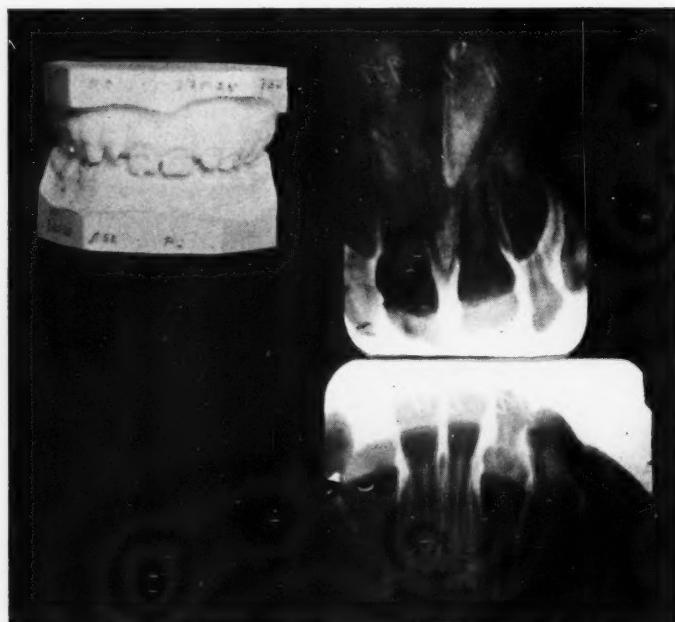


Fig. 8.—X-rays of girl five and one-half years of age. No models. Both maxillary and mandibular centrals just appearing through gums. At first, we were sure these were supernumeraries of maxillary centrals and the four mandibular incisors. The patient was told to return in about one year for examination.

Model of same child at ten years of age. Maxillary and mandibular anterior teeth well out, showing both maxillary centrals and four mandibulars denuded of enamel to just about one half of their crowns and there were no supernumeraries.

the greatest number are among canines and third molars. There is one thing we must be cautious about when we find impactions of long standing and that is to watch out for absorption of the roots of the teeth with which these impacted teeth come in contact.

The x-ray will also show up poorly constructed approximal fillings encroaching on the gums, also ill-fitting crowns both shell and porcelain, and last but not least, poorly adapted orthodontic bands. We have found in some young mouths the devitalization of permanent and deciduous teeth with diseased areas when the patient was perfectly unconscious that such serious conditions existed.

Now, I want to say a word about shortened root ends. A general prac-

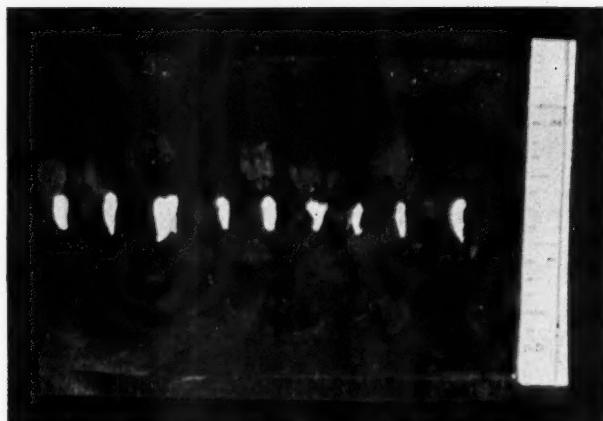
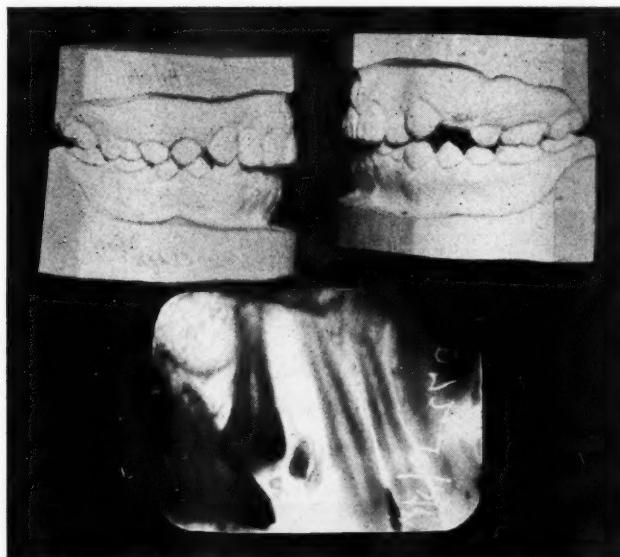


Fig. 9.—Photo of models of boy 13 years of age. Apparently unerupted left first premolar. X-ray revealed something retarding eruption of it. Photo shows what was removed by the exodontist (nine small supernumeraries). Gauge size from inch rule photographed with these teeth.

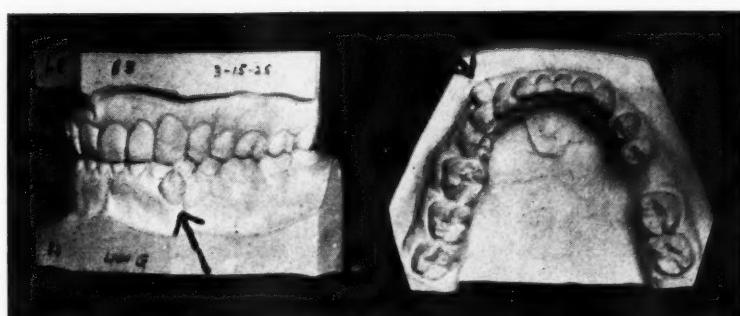


Fig. 10.—One of our embarrassing mistakes. Orthodontic treatment for severe malocclusion. When fifteen years later patient called, we found supernumary premolar (see arrow on mandibular right side).

titioner remarked that in most of his patients who had had orthodontic treatment, he found the roots of their teeth looked as though they had been amputated. We also have found a large number of them in our practice, especially of the laterals and a few centrals and canines, but regret to say we did not get x-rays of these patients before beginning treatment and will leave it with you for discussion. So unless we make x-rays of these developing teeth before treatment we can never tell or know what damage we may be doing to them, and I believe a "re-take" system every six months would be the best method to watch results.

I have found the intraoral films most satisfactory except in the case of a very young child when the extraoral films are at an advantage, especially in looking for the second and third molars. But for the detail of each tooth and to detect approximal cavities the intraoral films are best.

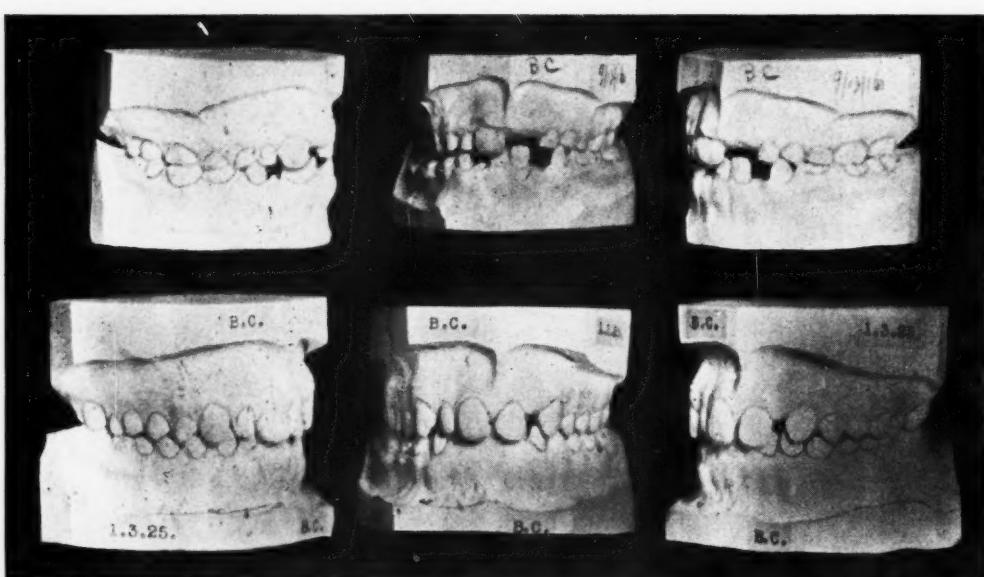


Fig. 11.—Case 11. Models of boy at eight and seventeen years of age. Tardy eruption of left central interested us. At eight years of age, x-ray showed its presence, but we did not study the film further. Nine years later he returned and we found the central had erupted, but to our surprise, the lateral was missing. In the meantime, he had had an accident, breaking the right central off, and this tooth was crowned. X-ray revealed a malformed lateral inverted and travelling upward. After seeing this film, we referred to the first x-ray, and, of course, could see this lateral with crown just formed pointing upward. Notice how it migrated during nine years.

Upon an examination of an x-ray many men have been so eager to discover what they thought suspicious that they failed to grasp the importance of some other parts of the picture which if taken from another angle would have afforded them other equally as valuable information.

In closing I wish to state that while we take hundreds of x-rays each month for our patients as the case progresses, we often "fall down" so to speak in our thoroughness of diagnosis and later find something of interest which had we discovered in the beginning would have changed our treatment. So it behooves all of us to make it a regular routine practice in our offices to x-ray all teeth.

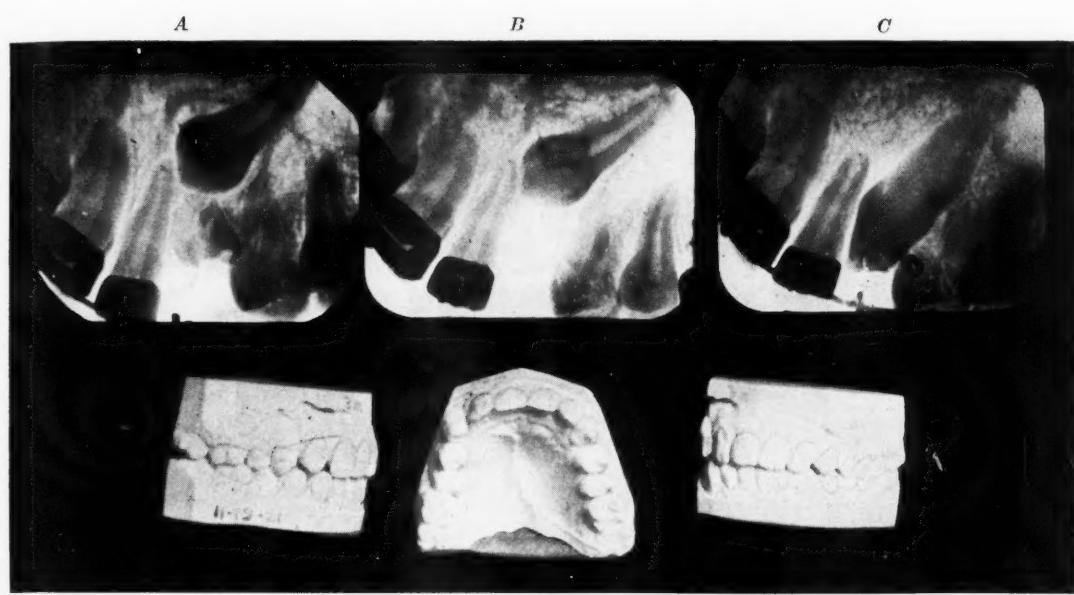


Fig. 12.—(a) X-ray of girl about 14 years of age. Film showed two or three fused small tooth germs retarding the eruption of the right canine.

(b) Same case ten months later. We were so eager to remove those tooth germs between the lateral and first premolar that we failed to see a well defined cusp lying on the canine which later proved to be the cause of an indentation in this tooth.

(c) Shows the canine with hook, about eight months after it was placed in the tooth. See study models in the accompanying photograph showing flatness of the left canine.

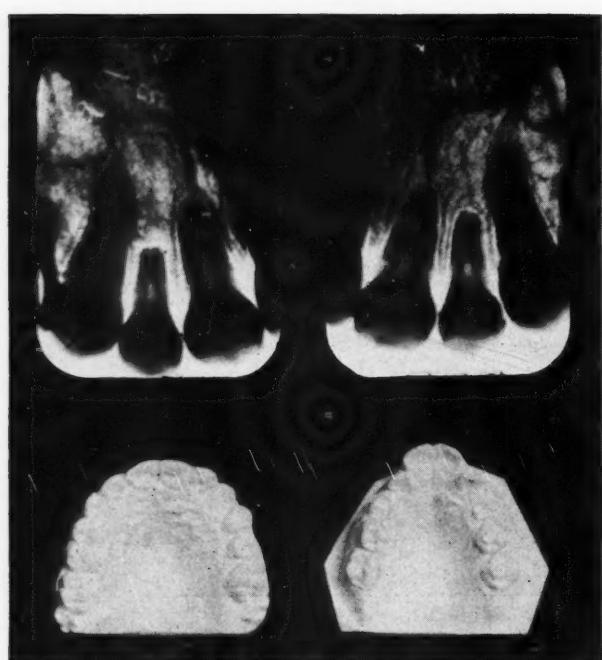


Fig. 13.—Models—occlusal view—of girl at eight and one-half years and at thirteen years of age. No x-rays were made before treatment, but were made at age of thirteen. Note shortened root-ends of laterals and centrals. What is the cause?

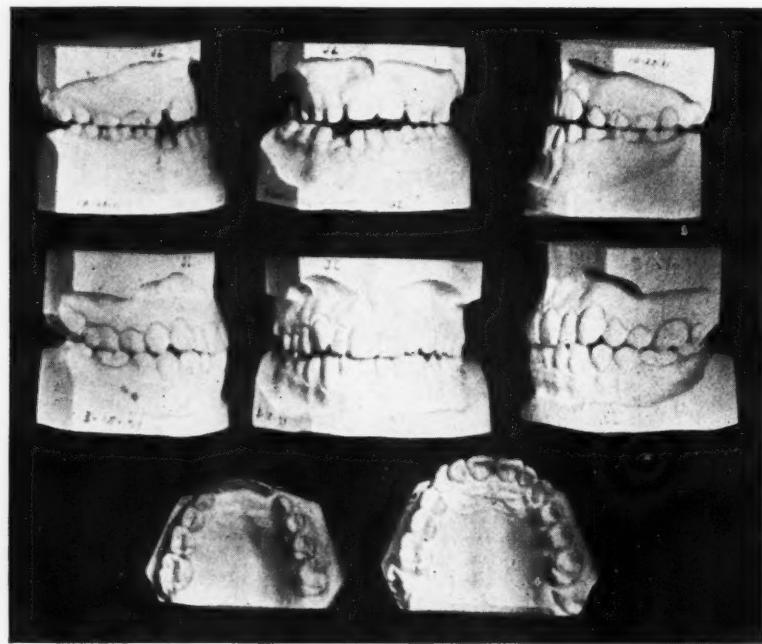


Fig. 14-A.

Fig. 14.—Case 14. (a) Models of girl before treatment and eight or ten years after all appliances had been removed.



Fig. 14-B.

(b) X-ray at age of 12 years, showing impacted right canine and absorption of root-end of lateral. X-ray eight years later of same lateral, which, from all appearances, seems to be healthy and of good color, but which is not in good alignment.



Fig. 14-C.

(c) X-rays of same case at age of 20 years, showing pronounced impaction of both maxillary third molars, while the mandibulars may erupt normally.

DISCUSSION

Dr. A. H. Ketcham.—I am greatly pleased with this splendid presentation of the importance of the use of the x-ray in orthodontic diagnosis which Dr. Gorman has given. In my discussion I shall only try to accentuate some of the points which he has brought out.

Gentlemen, our little patients are sent to us because we are supposed to give them the last word in scientific orthodontic knowledge, and most important of all, a correct diagnosis. Do we do it? We do not, and it is time that we should wake up. Otherwise, are we much better than charlatans?

Dr. Gorman has shown that if we do not have the aid of the x-ray, in many cases our diagnosis is of but doubtful value. We cannot be certain that we have not overlooked something of vital importance to the patient without full mouth x-rays, which include the dental films as well as the extraoral plates of each and every case which presents for consultation.

In the case illustrated in Fig. 1, dental films had been made at beginning of treatment, but not extraoral plates of the third molar region. The case was apparently finished. The young man, who had finished high school, started with college work, but

was obliged to give this up on account of a threatened nervous breakdown. I checked up with the extraoral plates and discovered this condition: There was an impacted mandibular third molar on the left side of the mouth; also an impacted maxillary third molar and a supernumerary, or fourth molar, superimposed over the crown of the third. Upon the right side of the mouth the condition was similar in the maxillary region; while in the mandibular region the third molar was present, but not impacted. After removal of the four third and two fourth molars, the young man showed a decided improvement in health. He gained twenty-two pounds in a few months' time and his nervous system became normal.

I have discovered fourth molars in two other cases in the last two years. In one of the latter, extraoral plates made at thirteen years of age did not show the fourth molars, but at sixteen and a half years of age maxillary fourth molars are shown to be forming.



Fig. 1.



Fig. 2.

Fig. 2. Conditions which will complicate our treatment are often discovered, as in this case of a seven-year-old girl where a supernumerary tooth is shown to be forming above a central incisor.

Oftentimes the careful observer in orthodontia will note that a patient even in the early teens may have an incisor which is more opaque than the adjoining incisors, usually of a yellowish cast. In these cases the x-ray will often reveal the beginning of calcification of the pulp, and in patients a little older sometimes complete calcification. If this condition is not discovered before orthodontic treatment is instituted quite likely the treatment will be blamed. The x-ray is also useful in checking the fit of bands.

We have, as Dr. Gorman has also pointed out, many cases in which there is congenital absence of one or more of the permanent teeth which should succeed the deciduous teeth. I found a number of years ago in checking some three hundred cases an average

of about one patient out of ten with one or more of the permanent teeth which should succeed the deciduous teeth absent. This did not include the third molars. This average is probably too high,—we could only tell by checking thousands of cases. Should we not know at the beginning whether this condition is present so as to plan our treatment accordingly?

We must not only have accurate radiograms but also correct interpretation of the radiograms, otherwise our patients may suffer. Fig. 3 shows a case of an eight-year-old boy in which my interpretation was at fault. It includes both right and left sides in the mandibular deciduous molar region. Upon the right side you can see the crypt of the second premolar with only the first stages of enamel formation, while upon the left side no second premolar crypt is shown either in this picture or in any of the several which were made. However, a small radiolucent area is shown just distal to the apical third of the mesial root of the second deciduous molar.

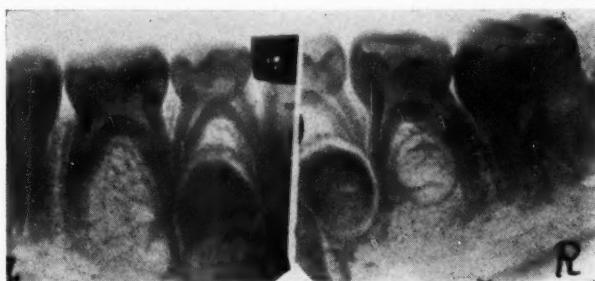


Fig. 3.

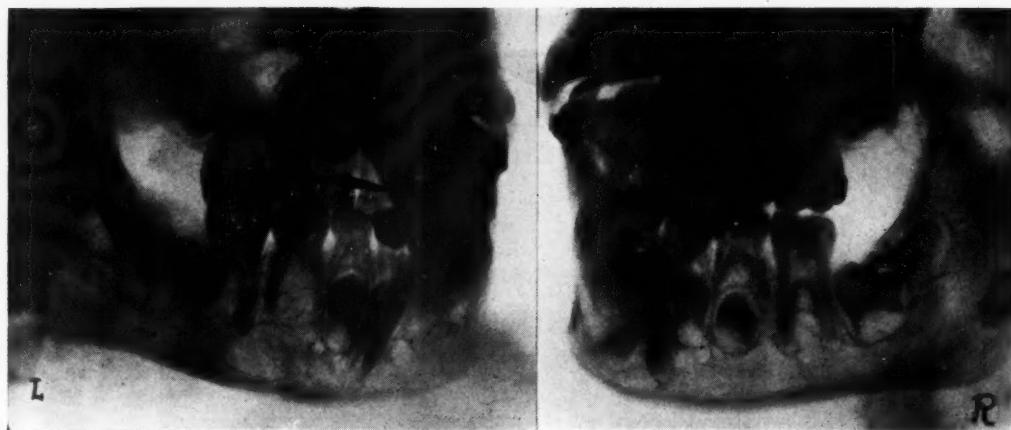


Fig. 4.

I diagnosed this case as congenital absence of the left mandibular second premolar. I treated the malocclusion which was a case of Class I (Angle) or neutral occlusion, then waited until a later time before taking up further treatment.

In the radiograms shown in Fig. 4, made when the patient was ten years and three months old, you will note that there is still apparently absence of this left mandibular second premolar, and also note the progress in calcification of the second mandibular premolar on the right side,—also the beginning of calcification of the third molars.

Fig. 5 shows the patient at eleven years and seven months of age. A second premolar is now forming on the left side where I thought there was none. Note that good progress has been made in calcification of the crowns of the third molars.

Fig. 6 is from a dental film which shows this left second premolar in clearer detail. Note its prone position.

Fig. 7 shows the case at thirteen years of age. Progress has been made in calcification in the year and a half which has elapsed,—also improvement in position. I think that boy is going to escape further orthodontic interference.

Another important point Dr. Gorman brought out was with reference to the discovery of decay. Oftentimes we find that the usual means of examining teeth for the presence of decay fail to locate approximal cavities. I had a case which I reported at one time of a boy of eighteen years of age. I was x-raying for presence of third molars and the picture showed that the left mandibular second premolar had a little cavity forming in its distal surface. It was only just through the enamel, a slight rarefied area showing, which I should have interpreted, but I was looking for third molars. A year later the boy lost the vitality of the pulp in that tooth just because I was not thorough in diagnosis.

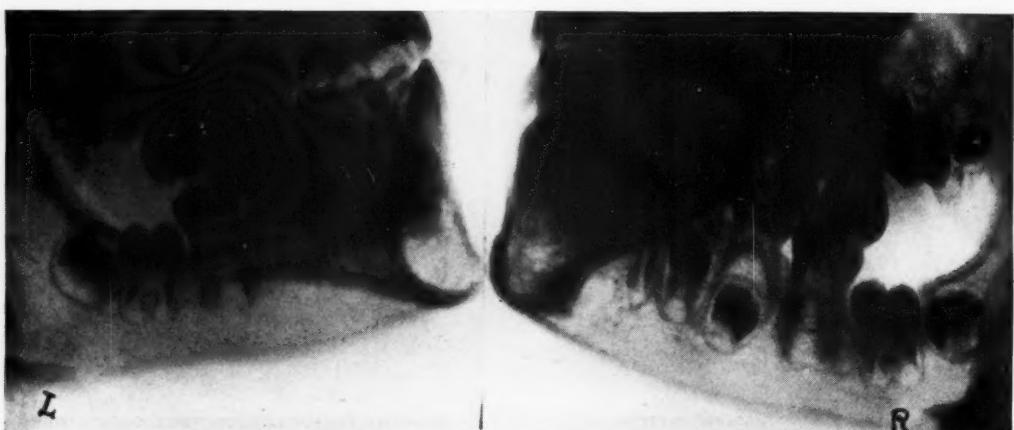


Fig. 5.

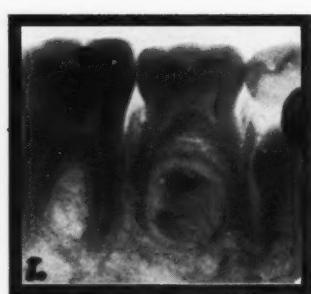


Fig. 6.



Fig. 7.

Fig. 8 was made in our regular check up of the third molar region, and shows a complexity of conditions existing in relation to the mandibular first permanent molar. The patient, a girl of fifteen, complained of no clinical symptoms except sensitiveness to cold. Notice the rarefied area around the ends of the roots of this first molar; also underneath the medium size occlusal inlay the area of decay involving the mesial horn of the pulp. Clinical findings reported pulp putrescent in mesial canal, some vitality in distal canal. This tooth has been extracted and the second molar is being moved up into its place.

Dr. Gorman has spoken of the problem which I believe is today the most serious of the problems confronting orthodontists, that is the problem presented by teeth the roots of which have become shortened during orthodontic treatment. We are all familiar with cases in which an impacted tooth has apparently caused the absorption of whole or part of the root of an adjoining tooth, as most frequently seen in the case of an impacted

cuspid causing absorption of the root of an incisor, or an impacted third molar causing absorption of a part of the root of the second molar. Cases also have been known in which the roots of permanent teeth have been found apparently absorbed without the presence of impacted teeth, or any other exciting cause being evident to the operator. I only mention these facts to help the orthodontist in his study of this problem, for we must find its solution,—otherwise fear of possible consequences from root absorption during orthodontic interference may cause dentists and the public to forget the great benefits which orthodontia confers upon humanity.

In approaching the study of this subject, let us note some of the things which a complete x-ray examination may reveal.

In Fig. 9 we have the case of a boy of sixteen who was referred to me after orthodontic treatment had been partly started. Bracket bands had been placed upon the maxillary incisors, but the ribbon arch had not been applied. In my radiographic

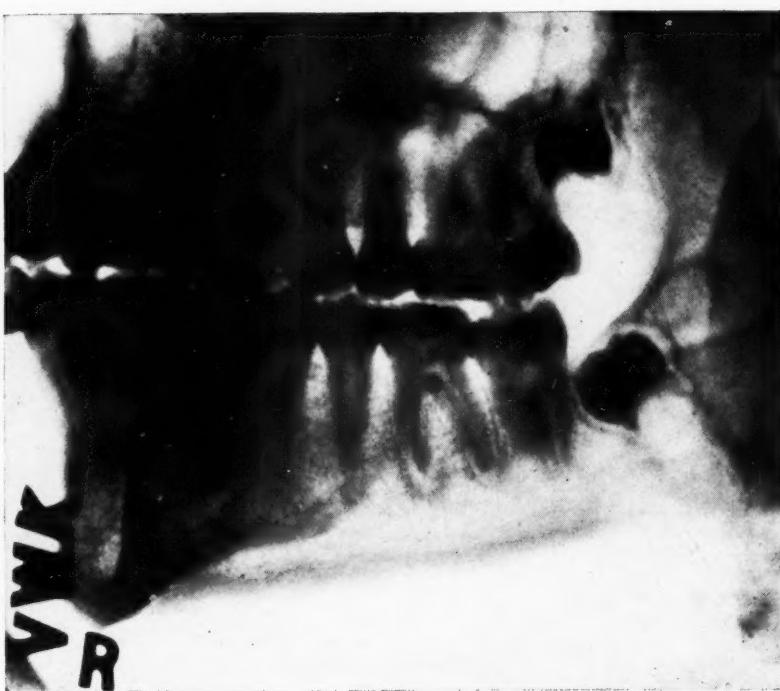


Fig. 8.

examination before the arch was applied I discovered the condition shown in Fig. 9, in which the left central incisor is shown to have a root which apparently stopped in its formation at about seven years of age. This incisor was protruding and may have received a blow.

In Fig. 10, *A* shows arrested development of the left maxillary central incisor root before treatment, while *B* shows the case a year later. Note that while there has been no progress in development of the left maxillary central incisor root, the right central incisor root has continued in its development.

In Fig. 11, *A* shows the case of a girl eight years of age, with the development of the roots of the central incisors having progressed until they are about the same length as the crowns. *B* shows it two years later where development of the central incisor roots has apparently stopped. In treating this case, an arch rigidly locked to bands upon central incisors was used with anchorage bands upon first permanent molars. A little more pressure was exerted against the central incisors than usual, for the reason that the first permanent molars had tipped forward impacting the second premolars.

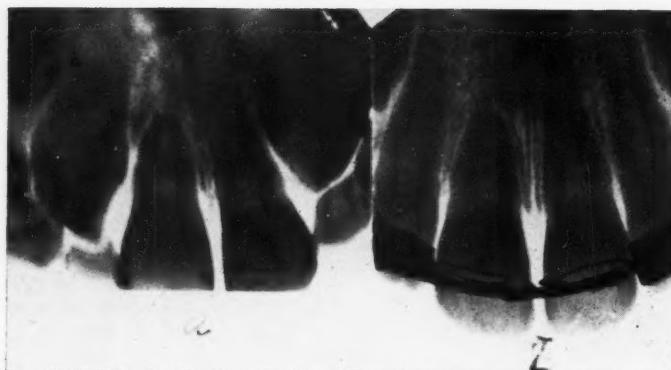
In interpreting your x-rays if the angles are not exactly the same in the pictures

taken a few months apart, you can check up by the comparative length of the crowns of the teeth, but always make an endeavor to have them the same.

Fig. 12 is the case of a girl aged fourteen years at the beginning of treatment. The x-rays of the incisors made before treatment was started are not clear enough for good reproduction; however, they show that the root of the right maxillary central



Fig. 9.



A. B.

Fig. 10.



A. B.

Fig. 11.

incisor was well developed. The right maxillary cuspid was impacted with the first bicuspid and lateral incisor almost touching. Bands were placed upon the maxillary lateral incisors and right central, while the left central was only ligated to the arch which was rigidly locked to the banded incisors. The varying degree of absorption of these tooth roots is shown by the x-rays made two years after beginning treatment. A lingual appliance with

auxiliary springs was used upon the mandibular teeth. You will see there apparently has been some absorption of the ends of the roots of these mandibular incisors.

In passing I should mention that we sometimes find disturbance at the ends of roots of molars which have been used for anchorage. You will find a thickening of the periodontal membrane. You may find it around the roots of the anterior teeth which you are moving, but that presents a picture in the radiogram similar to that produced by trauma. You will sometimes find molar roots the ends of which have been absorbed at least to a slight extent. I have never found them absorbed to any great extent. I have found incisor root absorptions taking place while moving teeth in patients as old as twenty-eight years.

What of the future of teeth having shortened roots? In answer Dr. Gorman has shown a picture of a lateral incisor with absorption apparently caused by an impacted cuspid, and spoke of the pulp retaining its vitality, and the tooth being firm enough for

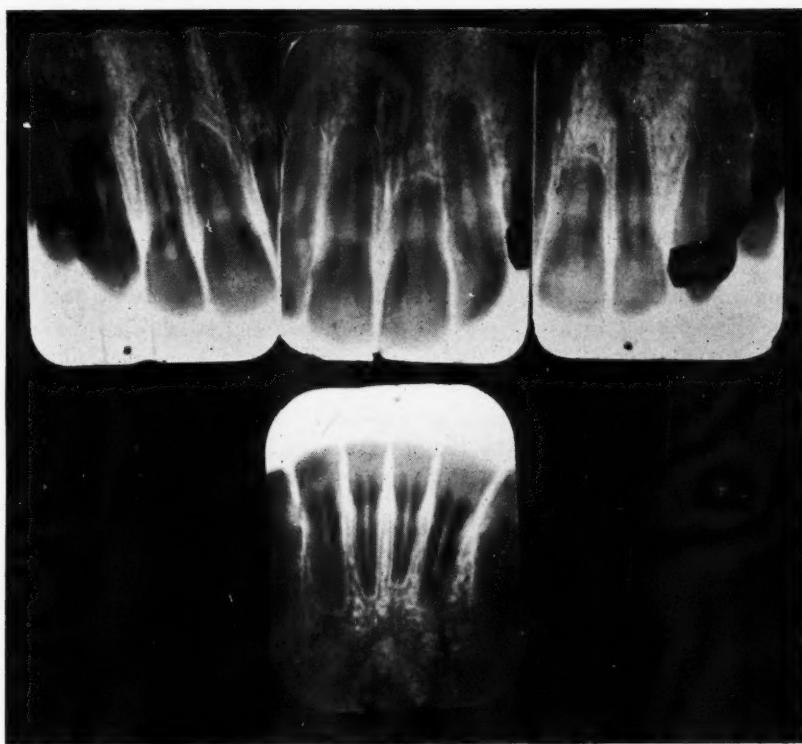


Fig. 12.

use years after the malposition and impaction of the cuspid had been corrected. I had a similar experience fifteen years or so ago in a patient aged seventeen. A maxillary left cuspid was impacted and had either caused arrested development or absorption of the root of a lateral incisor. At least a third of the root of the lateral incisor was missing. Under pressure upon the crown of the lateral the patient claimed that she could feel the end of the lateral incisor root grating against the crown of the cuspid. The lateral responded to tests for vitality. The case was treated. The cuspid was removed away from the end of the lateral incisor root and into its normal place. The x-rays made six years after treatment show that the end of the lateral incisor root had become rounded, whereas at the beginning it was as square as though it had been amputated, showing evidently a building on of cementum, and the lateral still responded positively to tests for pulp vitality.

However, it takes more than a few cases to prove that the usefulness and life of these teeth with shortened roots has not been impaired.

It is only through cooperation of the great majority of orthodontists in checking

through use of the x-ray all cases under their care,—then tabulating all cases in regard to age of patient, health, growth, diet, calcium metabolism, type of appliance used, frequency and degree of adjustments, length of time appliance was used, comparative number showing root disturbances, etc., coupled with the work of scientists who are conducting experiments upon animals through mineral and vitamine deficient rations,—that we may arrive at the safest method of treatment of orthodontic cases.

Many cases of root absorption have been reported to me by orthodontists. Thousands more are necessary to aid in solving this problem, and they are to be had for only the x-ray examination of the majority of your patients. Will you help?

President Howard.—Thank you, Dr. Ketcham. The paper is now open for general discussion.

Dr. F. M. Casto.—Mr. President, may I have the privilege of showing a few slides?

I hope that we all appreciate the importance of this subject. The routine practice of making full-mouth x-ray pictures previous to orthodontic treatment, and checking up the cases with additional pictures at certain intervals during the progress is, obviously, a very necessary procedure.

I have a few slides to show, some of which I think will be of interest to you.

I get the best results by using the large sized—No. 2—films for the anterior teeth and the extraoral plates or large films for the posterior teeth.

While there is not so much minute detail shown in the extraoral pictures, and especially if one wishes to look for cavities, they do give a much more comprehensive view of the teeth and the contiguous tissues. In any case where more detail is necessary or localization of certain teeth is desired films are used in addition to the extraoral plates.

Figs. 1 and 2 illustrate the type of pictures made from the No. 2 films before and during the orthodontic treatment. The patient was about five and one-half years of age.

Figs. 3 and 4 show the beginning of calcification of the third molars, and while there is apparently sufficient room in the jaws for their development and eruption, on account of the position of the mandibular third molars there might be some question as to whether or not they will ultimately become impacted. The patient is twelve years of age.

Figs. 5 and 6 were made during treatment. The beginning of calcification of the third molars is very distinct. The interesting thing to me is the rotation of the second mandibular premolars. I have found a large number of cases in which these teeth were rotated. I have no explanation as to the cause. The patient is twelve years of age.

Figs. 7 and 8. In this case there is almost normal development, notwithstanding this, however, the second mandibular premolars are rotated. It is important in such cases to extract the deciduous teeth at the proper time. The patient is eight years of age, and the beginning of the calcification of the third molars is well defined.

Fig. 9 shows an interesting case. The patient is seven and one-half years of age. The first maxillary molar on the right side has encroached upon the deciduous molar causing absorption of its distal side and impacting itself. There was in addition quite a little dissolution of tissue which was accompanied by some pain and distress from time to time. There was no apparent cause for this condition. The arches and bone were well developed and the physical condition of the teeth, mouth, and child almost perfect.

Figs. 10 and 11 show rather an interesting case of an impacted second maxillary premolar. The tooth is lying horizontally with the occlusal surface approximating the root of the central incisor. The patient was advised more than a year ago to have the tooth removed, but has not done so. The occlusion is almost perfect. This is another good reason for having radiograms when there is a question of a doubt. The patient is eighteen years of age.

Figs. 12 and 13 show a small supernumerary tooth lying upside down in the concavity of the left maxillary central incisor. It has caused the impaction and diverted the direction of eruption of the central incisor. Fig. 13 shows the case after the removal of the supernumerary tooth.

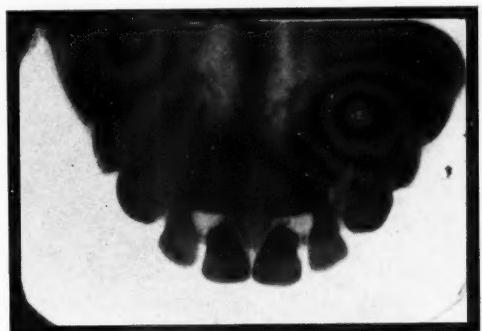


Fig. 1.



Fig. 2.



Fig. 3.



Fig. 4.

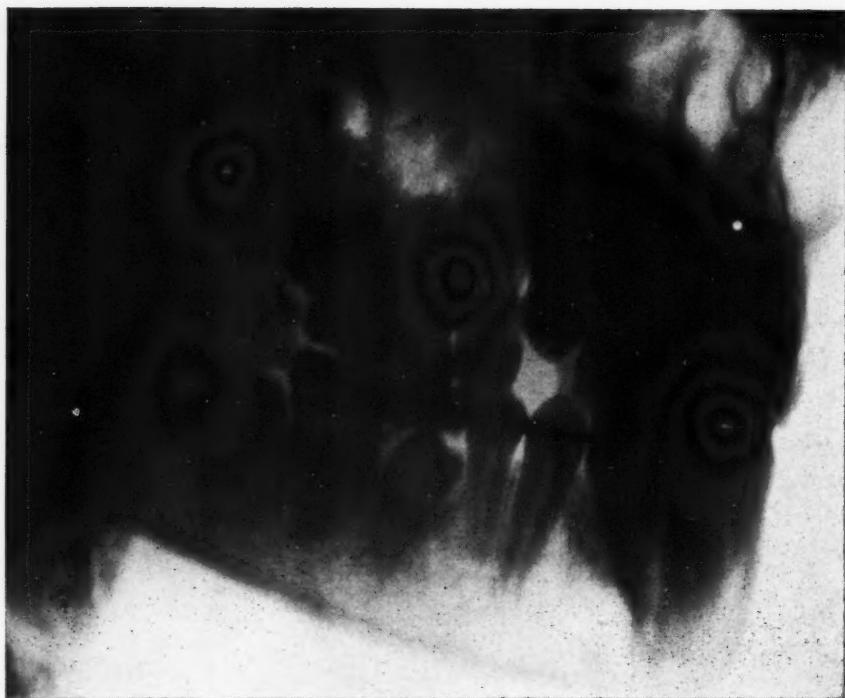


Fig. 5.



Fig. 6.



Fig. 7.

Figs. 14 and 15. This was quite an interesting case. This little girl eight and one-half years of age, by an accident broke off the central incisor tooth, the pulp became putrescent and abscessed, and the tooth was removed. Subsequently the patient was referred to me. Following the regular routine of making full mouth x-ray pictures, I



Fig. 8.



Fig. 9.

discovered two supernumerary teeth, one on each side of the median line, lying upside down as shown in Fig. 14. Both were removed as shown in Fig. 15.

Figs. 16 and 17. This case indicates quite definitely the necessity for making full mouth pictures before orthodontic interference. The patient a boy six years of age, with all of the deciduous teeth in position, showed no evidence from a casual or ordinary examination that there was any unusual condition present. The radiograms disclosed



Fig. 10.



Fig. 11.



Fig. 12.



Fig. 13.

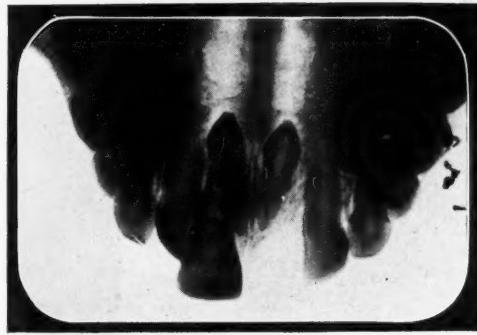


Fig. 14.

the presence of a supernumerary tooth lying upside down, between the maxillary central incisors, just to the right of the median line and upon the lingual side. It had caused a rotation of the central and lateral incisors. The supernumerary tooth was removed as shown in Fig. 17.

Figs. 18 and 19. This is a case that came into the office three or four days before I left and I have not been able to make a diagnosis. The patient is eight and a half years of age. The left maxillary central incisor is impacted, and there seems to be a supernumerary tooth lying on the lingual side in the concavity of the central. The

central looks to be abnormally large. I have taken several different angles, but have been unable to analyze the condition. Your cooperation and advice is requested. I have several films with me which I should like to submit to the expert radiographers present for their interpretation.

President Howard.—Is there any further discussion of this paper?

Dr. M. N. Federspiel.—In discussing the subject I would like to call to your minds one slide that Dr. Ketcham showed. (One of the slides which Dr. Ketcham used was thrown on the screen.)



Fig. 15.

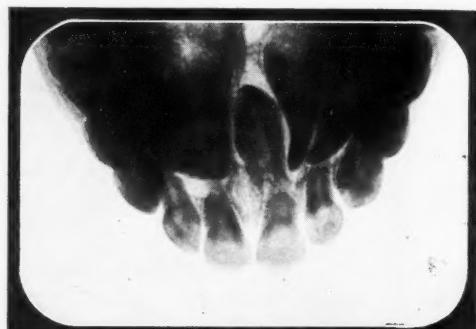


Fig. 16.



Fig. 17.



Fig. 18.



Fig. 19.

You will notice this line around the root of these teeth is very pronounced and enlarged. Pathologically we define this morbid condition as diffused proliferative pericementitis. This proliferation of the pericemental membrane will have a tendency to absorb by pressure the root itself and the bone surrounding it, in order to make room for the constant piling up of the cellular elements of the pericemental membrane.

The process of any irritation which remains constant is an abnormal process, and causes tissue destruction in order to make room for the growing tissue. This growing tissue is usually of the chronic type, and may be defined as chronic inflammation. This can better be illustrated by considering a follicular cyst. The cyst, as it enlarges, will destroy the surrounding bone tissue. In other words, the cyst mass builds itself gradually into its own shell.

The process of physiologic irritation is never constant, but is interrupted. You cannot walk constantly. The walking must be interrupted. So is the heartbeat interrupted in the period of rest and action. Orthodontic treatment can accomplish better results when the pressure is interrupted than if it were constant. For instance, the finger-spring movement is constant. The screw method is interrupted. I am quite satisfied that there is less absorption of tooth substance taking place when the movement of the tooth is done by interrupted irritation, but if the irritation were constant, one may look forward to absorption of tooth substance and surrounding tissue which will become a pathologic manifestation.

Dr. C. A. Hawley.—I think the object of Dr. Gorman's paper was to emphasize the advisability of thoroughly x-raying every case. Dr. Gorman has had a great deal of experience. Most of the men who have spoken here thus far have had a great deal of experience. I have had some experience myself, and I feel today that every time I take on a case without having an x-ray photograph in the first place, I am laying up trouble.

You have had illustrated here many, many different kinds of things that are disclosed by the x-ray photograph, things that you didn't expect.

I wish to particularly emphasize Dr. Gorman's reference to the attention to decay. I have had the interesting experience recently of having a dentist send me his daughter, saying she was all ready for orthodontia; upon x-raying her mouth I sent her back to him to fill five cavities.

I have had another dentist send me his daughter, and in answer to my question as to whether he knew whether all the permanent teeth were present, he told me yes, that he had x-rayed them and they were all present. I took his word for it. I have the case half-way completed now. I began to suspect that one of the mandibular second bicuspids was absent, from the appearance of the gum; I sent back for another x-ray photograph, which showed that that tooth was absent.

Washington is noted for the gay and festive practice of what is called "passing the buck." It is a social center, and there is a great tendency among dentists there to pass the buck in regard to decay. If any decay occurs within four or five years after you have treated a case, you caused it. I don't suppose that happens anywhere else. But I have come to consider this extremely important: that all the beginnings of decay, the softening of the teeth be accurately noted in the x-ray, and I think we have found that they are discovered by the x-ray where they are not discovered in any other manner.

There are many side issues to this paper. We could discuss it until five o'clock tonight and probably not cover it.

The practices of different orthodontists in regard to their x-rays, whether they take them themselves or whether they have them taken, are interesting, but the main feature is for them to have them taken.

As for myself, in my own situation, I don't take my own x-rays. I take photographs of the face, but I don't take x-rays, for the reason that I can get such competent service there without doing it myself. We have two or three firms there who take full x-rays of the mouth for five dollars, and I think I can safely say there is no dentist in the city who can equal those x-ray photographs. It gives me a little tremor when I hear dentists say, "I will take these photographs for you," because I know they won't be right. In addition to the very excellent x-ray photographs which I get from these firms, if I send a patient before three o'clock one day, those films will be on my desk the next morning.

I don't think that extraoral pictures or intraoral pictures alone are sufficient. There are details in cavities, and in bone formation that are shown by the intraoral x-rays, and

there are positions of the third molars and other things that can only be shown by the extraoral. The best method, and the one that I think is most satisfactory today, is to have both—and they are not expensive to the patient. The patient pays for it, of course. If I had to pay for those myself, in my situation, it would be worth having them done.

I could show a great many examples of absorption of the teeth which have become very interesting, and we could discuss here the question of what kind of appliances produced them. My own opinion is that it isn't the appliance at all that causes that; it is the incident of handling them. I don't say it is the competence of handling them; it is the incidence of handling them.

I have abused teeth terribly in my time. I don't see how they stayed in the mouth, yet they stayed alive, and stayed in healthy condition. In other cases I have been extremely careful and still have run into trouble. Why it is, I don't know. I have found shortened teeth. I have found them impacted, and I have observed teeth moved with all different appliances, and not found them injured at all. I can't say they are produced by the appliances, and I don't know what does produce them, except I feel certain that they do follow the eruption of a permanent tooth against another one, as occurs when eus-pids come against lateral incisors—the tooth becomes cut half off. That seems to be the natural sequence.

But I think this is a very important and interesting paper and I think it is one that should be extensively discussed, and I hope every member here who has anything interesting to present will do so.

President Howard.—It is now about 12:29, but if you have something more that you can shoot more or less quickly, we shall be glad to listen to it.

Dr. G. W. Grieve.—I have under treatment a boy with the condition, as reported by Dr. Ketcham, of late development of a mandibular second premolar. Radiograms were taken by Dr. Wilson of Pasadena when the boy was about six years of age. These show the crowns of three mandibular premolars nearly complete in their development, but no sign of the right second. A radiogram, taken one year later, shows the occlusal surface of this tooth apparently pointed lingually. The patient is now nearly fifteen, but this tooth has not yet erupted. It can be felt, by digital examination, upon the lingual aspect. Recent radiograms show it lying somewhat across the arch. I think it may eventually erupt unaided. The parents, a year ago, refused permission to open into it for the purpose of aiding its eruption.

I should like to mention one other thing and that is that in some cases, where impacted mandibular third molars have been removed, there remains a nasty pocket at the distal of the second molar. In many instances these third molars can be straightened up very easily by the use of a light spring, the end of which is adjusted in a small pit in the occlusal surface of the tooth, the pressure being directed first distally and later occlusally.

Dr. L. H. Wirt.—I regret to prolong this discussion, but there was one feature that the discussors did not bring up which I could not refrain from mentioning, and that is: I do not believe that we are doing our full duty to the patient unless we make some effort to bring before the dentists themselves the necessity of x-raying all cases in which children are presented for extraction of deciduous teeth, where they haven't absolutely positive evidence that the time is ripe for that extraction, because we have too many cases coming to us for orthodontic treatment which might have been prevented if the dentists themselves had not made the mistake of extracting too soon, or of delaying extraction too long.

President Howard.—Has anybody else anything to say? If not, then I will ask Dr. Gorman to close the discussion.

Dr. J. A. Gorman.—I haven't a thing to say, except that if I have carried one point home that will set you thinking I am satisfied.

President Howard.—I am quite sure, that you have carried not one but a number of points home.

ABSTRACT OF CURRENT LITERATURE

Covering Such Subjects as

ORTHODONTIA — ORAL SURGERY — SURGICAL ORTHODONTIA — DENTAL RADIOGRAPHY

It is the purpose of this JOURNAL to review so far as possible the most important literature as it appears in English and Foreign periodicals and to present it in abstract form. Authors are requested to send abstracts or reprints of their papers to the publishers.

Symposium on Focal Infection. Journal of the American Dental Association, April, 1926, xiii, 4.

Dr. Hartzell leads off with a review of the recent and older literature on this subject. Prominent in causing the pendulum to swing radically toward focal infection have been Price, Rosenow, Hayden and Billings, all of whom have based their conclusions on the results of research. The work of Duke, while not directly antagonistic, is much more conservative and more in harmony with the natural attitude of the dentist against promiscuous extraction. The author, with Henrici, has made many exhaustive researches into the problem and has reached the conclusion that bacterial growth in pulps does not necessarily mean clinical infection. The radical element leans on presence of bacteria and analogy from animal experiment, while the conservative is, for one thing, not satisfied with believing that disappearance of certain symptoms after extraction of an infected tooth is proof that the patient has been cured of a focal infection. The radicals state that infected teeth must come out because they cannot be sterilized in situ. This sweeping statement has been disproved by the experience of men like Rhein, Callahan, Johnson, Howe and Buckley. Rhein has been filling the roots of pulpless teeth for thirty-two years and has all of his records intact. Cures of arthritis may be seen after such treatment no less than after extraction. The author has the courage of his convictions for he still retains three pulpless teeth himself.

Miloslavich, of Milwaukee, sums up his contribution to the discussion by stating that, if the theories of the extreme focal infectionists are logically carried out, the Americans will eventually become an edentulous nation.

Rickert, of Ann Arbor, states that not so many years ago dentistry passed from being a mere mechanical art to a branch of general medicine and surgery. It was inevitable that false doctrines and abuses should arise, and especially in the form of hasty and premature generalizations. One myth, that all pulpless teeth shortly became hopelessly infected, was followed by another, that infected dentin cannot be sterilized. As for the former the author has learned from thousands of tests that over half of all teeth are infected when there is reason to think of infection. Even if the proportion

should turn out to be 75, there would still be a residue of 25 per cent of harmless pulpless teeth, even admitting that the others were a menace. In regard to infected dentin the author knows of no proofs for this statement. Other myths have to do with the belief that sterilization of root canals may be followed by adaptation to the antiseptic by the microorganisms present and that the virulence of the latter is increased by the presence of the filling material. Animal experiment based on injecting pulpless tooth débris into the circulation is a far-fetched test.

Carl Beck, speaking for the general surgeons, insists on a dispassionate and patient attitude and rigid adherence to scientific investigation to the exclusion of all theory.

Epidemic Stomatitis. Becker (Saarbrücken). *Zahnärztliche Rundschau*, April 18, 1926, No. 16, p. 276.

This affection is of two types, the ordinary and the virulent. The causation is not known. We rarely have the opportunity of seeing the first appearance, which is that of a dull white spot on the mucous membrane, so faint as to suggest a mere haze, presenting no line of demarcation with the healthy membrane. From such a spot the disease spreads. This initial manifestation is by no means always present, for the disease may first begin in some already abraded area or seat of minor traumatism of any kind, notably those made by sharp fragments of teeth or badly fitting prosthesis. However it begins, it diffuses itself rapidly so that in a few days the disease involves a large portion of the buccal mucosa. Under proper treatment it vanishes as rapidly as it came and this behavior serves to differentiate it from ordinary stomatitis, which is apt to pursue a much more chronic course. When the patient is seen the greater part of the mucosa is seen to be of a yellow or brownish hue and pus may readily be wiped from it. The breath is very offensive. Characteristic is the superficial involvement for, contrary to what we should expect, the mucosa is but slightly swollen. The virulent type makes up about 10 per cent of all cases and is remarkable for its close resemblance to diphtheria. It is almost always circumscribed and limited to the vicinity of from three to five teeth, mostly in the upper jaw. Unlike the ordinary form it burrows and causes necrosis of the jaw with loosening of several teeth. The epidemic character of the disease was abundantly shown during the war. The sex ratio is about 3 to 2 in favor of the male. The author was in touch with several thousand cases during a period of two and a half years. The greatest incidence was in some of the metal trades and those who were much in contact with metal, notably locksmiths, chauffeurs, mechanics, but nothing is known of the intimate nature. The affection yielded promptly to hydrogen peroxide.

Recovery from Facial Neuralgia after Resection of Roots. A. Rohrer (Hamburg). *Vierteljahrsschrift für Zahnheilkunde*, 1926, xlvi, No. 1.

The author sums up his case history as follows: A tooth in the lower jaw bearing a granuloma at its apex may set up neuralgia of the second branch of the trifacial nerve. Dental investigation in such cases must be

thorough, not merely confined to inspection, palpation and percussion, but a roentgen plate should be made and tests made with the faradic current. In cases in which neuralgia is associated with a granulomatous root, the latter along with the granuloma itself should be extirpated both because of the causal relationship and to enable the patient to chew on the affected surface. This treatment is to be thought of in all cases in which prolonged facial neuralgia is believed to depend on a dental affection. In performing the resection one may use the Payr method of anesthetizing the second branch of the trifacial, which is intended for major operations, or he may simply inject alcohol into this branch, Payr also recommending a special technic here as well. In the author's case the relief from pain which instantly followed injection of alcohol was sufficient reason for employing the method, although at the time he had made no diagnosis of the cause of the neuralgia. Two weeks later, although the second branch of the nerve remained quiet, the third branch, supplying the mandibular region, developed neuralgia for the first time, although for twenty-two years the pain had been located entirely in the upper jaw. It was then that a roentgenogram revealed a granuloma on the root of the first premolar of the left lower jaw.

Three Mistakes in Diagnosis. Hentze (Kiel). Correspondenz-Blatt für Zahnaerzte, 1926, 1, No. 3.

The first case occurred in a woman physician, who complained of an irritation in the root of a bridgework pillar. It was almost Christmas and the patient did not care to have the bridge removed and root treated, so that Hentze merely injected half an ampoule of "presoiod" beneath the gum. The soreness left and the patient was able to chew with the bridge. She later broke out with a rash which was thought by the patient and her husband, also a physician, to be due to the iodine in the local anesthetic. The author concurred, although there was no iodine of potassium in the urine. Next day there was fever of over 104, with Koplik's spots in the mouth and later an eruption of measles. The diagnosis of iodide acne had been erroneous. The second patient was a physician's daughter who had recently submitted to the extraction of the molars and premolars of the lower jaw for severe toothache. She wished further extraction. The author, who had not been the one who pulled the teeth, made an exhaustive examination, including a roentgenogram, and found two teeth (the canines) from which he removed root fillings, entering a cavity which gave off putrid gases. He treated and finally filled the roots, with complete cessation of the pain. In this case the error in diagnosis was not made by the author but by the dentist of the patient's home town who had wrongly imputed the toothache to the molars and bicuspid teeth in place of the canines. Failure to recognize pulp gangrene of the canines had cost the patient ten of her back teeth. The third patient, a middle aged woman, complained of pain in the tongue thought to be neuralgic or due to the irritation of a rough tooth. In removing the latter, section revealed gangrene of the pulp, due possibly to carbolic acid used in treating the pulp cavity.

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EDITORIALS

The First International Orthodontic Congress

THE First International Orthodontic Congress will be held in New York City, August 16 to 22, 1926. This Congress will mark the twenty-fifth year of orthodontic specialization in America.

It is true that a few men may have specialized in orthodontia prior to 1900, but the dental and medical professions were not aware of the science of orthodontia until after the organization of the American Society of Orthodontists. This society was organized in St. Louis by Dr. E. H. Angle and a group of his students. It was really the outgrowth of an attempt on the part of Dr. Angle to teach orthodontia as a postgraduate subject. He organized the Angle School of Orthodontia, and for a number of years the membership of the American Society was made up almost entirely of the students of the Angle School.

About 1905, the European Society of Orthodontists was organized. Dr. William G. Law, a student of the Angle School, took an active part in the organization of that Society, and we believe that he was its first president. A few years later a society was organized in Great Britain; it was known as the British Society for the Study of Orthodontics. The Alumni Society of the Angle school was organized about 1906 and was followed a few years later by the organization of the Eastern Society of Angle Graduates on the Atlantic Coast and the Pacific Coast Society on the Pacific Coast. The Alumni Society of the Dewey School of Orthodontia and the Alumni Society of the International School of Orthodontia were also recognized in this country. About 1920 other societies were organized in the United States representing the local communities. Societies were also organized in France and Germany and possibly in other countries.

In 1924 Dr. William C. Fisher was a candidate for the presidency of the American Society of Orthodontists. He conceived the idea of organizing the First International Orthodontic Congress. It was necessary to sell this idea to the American Society of Orthodontists, and this was accomplished at the meeting in Kansas City in 1924. Upon receiving authority from the American Society of Orthodontia to proceed with the plan of organization, Dr. Fisher appointed an Organization Committee. In order to present his plan before the Orthodontic societies of Europe he made a trip to Europe in 1924 at his own expense. By the time the American Society met in Atlanta, Georgia, in 1925, the plan of organization was well outlined, and it was adopted by the American Society of Orthodontists. All of the orthodontic societies in America and abroad have become component parts of the International Orthodontic Congress, with the exception of the Pacific Coast Society of Orthodontists. For some unexplainable reason the Pacific Coast Society has not become a member.

At the present time the Program Committee has secured a large number of papers from many men prominent in the profession, and about an equal number have been secured from America and from Europe.

The Clinic Committee is preparing a series of educational clinics. These clinics will show various orthodontic technics as practiced by men in different parts of the world. The clinics will be so prepared as to be educational in nature and available for study to those interested in the science.

There will also be a series of educational exhibits, covering such subjects as orthodontic surveying, radiography, photography, and diagnosis.

These meetings will be of great interest to all connected with the science of orthodontics, and the Board of Directors have made a proposition whereby anyone interested in the science can become an Associate Member with the privilege of attending all scientific meetings and receiving a bound volume of the Transactions of the Meeting. Associate members will pay no greater membership fee than will active members.

It is our belief that the First International Orthodontic Congress will mark a great step forward in organized orthodontics. We urge every one interested in the science to become a member and attend.

Dr. Howard's Report on Children Treated for Spinal Deformity

IN THIS issue of the JOURNAL there appears a preliminary report by Dr. C. C. Howard, of Atlanta, Ga., in reference to the malocclusion produced in the patients at the Children's Hospital during the treatment of spinal deformity.

This preliminary report is the mere statement of facts as they exist. The matter which Dr. Howard has called to the attention of the orthodontic profession has a much greater bearing upon orthodontic science than may be realized at the first reading of the report. The report is interesting in that it deals with a "produced deformity." Our attention was first called to the malocclusion or deformity of the face that was being produced during the treatment of spinal curvature by Dr. Howard early in December, 1925. In February, it was our good fortune to visit the Crippled Children's Hospital at Atlanta with Dr. Howard, and see a number of these cases under treatment, and go through the hospital records.

We were pleased to find that the hospital authorities had been making orthodontic records without realizing it. Photographs of the patient in different positions showing spinal deformities, also gave a very good full and profile view of the face. Unfortunately, no attention was paid to the occlusion of the teeth and such information as could be obtained was secured from the nurse and the parents. It was very evident from the study of the photographs that the long faces had been made short and the short faces had been made shorter. In the study of every patient, compared with the original photograph, it was very evident that the distance between the nose and chin had been shortened as a result of treatment. The fact has been established that, as a result of pressure on the body of the mandible, a decided facial change had occurred. The first evidence of this facial deformity was called to the attention of the hospital authorities by the head nurse. The nurse had observed the face of a patient who was entered for treatment when she was leaving for a vacation. Upon her return to the hospital, the nurse discovered that the facial outline of the patient, who had been wearing a plaster cast for some time, had been changed. She informed the doctors that while they were straightening the patient's back, they were also ruining the face. This fact was very evident to the medical staff. Dr. Howard was called into a consultation in order to see what could be done for the deformity already produced, and also to devise a plan to eliminate such facial deformities in the future.

Since the consultation with Dr. Howard in February, it is our belief that he has a plan in mind for preventing these deformities which is both practical and simple. We do not know, however, whether it will be possible to prevent a slight shortening of the face, but we are sure that the shortening will be materially decreased and the protrusion of the maxillary incisors prevented.

In studying the illustrations in connection with Dr. Howard's report it will be seen that the mandible and occipital region support the upper part of the body, including the shoulders, arms, and chest, by the cast resting upon the hips. As a result of this treatment the patient's head is thrown back and

he walks around the hospital looking up. There is a constant effort made to lower the head so that he can look down; this produces constant pressure on the mandible, with the result that the lower part of the face is shortened. It is our belief that if a careful measurement were made of the nasal cavities before treatment, we would also find the nasal cavities changed as a result of the pressure being transmitted to the maxillary and mandibular teeth. Some of these cases studied from the photographs of the faces show that the nose is actually closer to the forehead. In other words, the whole face changes as a result of external pressure. Pressure which is used to correct the deformity of the spinal column is unfortunately transmitted to the bones of the face and the bones of the face also change; this is unfortunate, since the change is from a normal to an abnormal relation. These cases demonstrate the fact that bones change as a result of mechanical stimulation. These children have assumed a masticating habit similar to the alligator, namely, they move the face and cranium, instead of moving the mandible, because the pressure of the plaster cast against the mandible makes it impossible for the mouth to be opened except by moving the cranium. It is our belief that if this mode of mastication continues long enough, there will be a decided change in the temporomandibular joint.

Since there is such a decided change in the face, Dr. Howard has already called attention to the possibilities of treating deformed mandibles and open-bites by the use of external pressure. There is no question but that a great many patients are suffering from open-bites caused by deformed mandibles.

It is our belief that a great many patients suffering from protrusion of the mandible could have the shape of the mandible changed by external pressure applied in the same manner as the pressure is applied to children with crooked spines. Some may contend that such an orthodontic treatment would not be practical, but in open-bite cases it is our belief that we would be justified in recommending that these children go to a hospital where they could have positive pressure on the mandible. The result would justify the treatment.

A number of articles have appeared in European orthodontic literature in which the authors claim remarkable results in treating deformed mandibles by using an extraoral anchorage in conjunction with the chin cap.

We believe the wearing of the plaster cast to correct mandibular deformities, as suggested by Dr. Howard, is a justifiable procedure. We are quite sure that in a few months Dr. Howard will be able to give clinical evidence to the profession which will be of untold value in regard to facial deformities and the use of external pressure to prevent or control those deformities.

ORTHODONTIC NEWS AND NOTES

First International Orthodontic Congress

PRELIMINARY PROGRAM

The First International Orthodontic Congress will be held at the Hotel Commodore, New York City, August 16 to 20, 1926.

1. *Badcock, J. H.*—London, England
The Place of Extraction in Orthodontic Treatment
2. *Chapman, Harold*—London, England
Orthodontics: Further Investigations in Etiology
3. *Chivaro, Angelo*—Rome, Italy
Correlation Between Orthodontontology, Dental Prophylaxis and Hygiene
4. *Derivaux, R. C.*—Nashville, Tennessee
Title not yet received
5. *D'Alise, Corrado*—Naples, Italy
Orthodontia and Dentistry in the Medicine of the Twentieth Century
6. *Detlefeen, J. A.*—Philadelphia, Pa.
Developmental Limitations Imposed by Hereditary Factors
7. *Friel, Sheldon*—Dublin, Ireland
Occlusion—Observations on Its Development from Infancy to Old Age
8. *Howe, Percy*—Boston, Massachusetts
Influence of Feeding on Malocclusion
9. *Hellman, Milo*—New York, New York
Changes in the Human Face Brought About by Development
10. *Izard, G.*—Paris, France
 - A. Use of the Gonio-Mandibular Angle in Orthodontia: Its Measurement on the Living Man: Its Practical Importance and Result
 - B. New Predetermination of Normal Dental Arches Grounded by Constructing an Individual Curve, According to Some Facial Diameters
11. *Johnson, A. LeRoy, Appleton, J. L., and Rittershofer, L. S.*—Philadelphia, Pa.
Tissue Changes Incident to Tooth Movement.
12. *Kadnor, Albert*—Hamburg, Germany
The Necessity of an Individual Therapy Instead of Schematizing Methods
13. *Ketcham, A. H.*—Denver, Colorado
A Study of Pathologic Root Absorption
14. *Kantorowicz, Prof.*—Bonn, Germany
The Self-correction of Orthodontic Anomalies
15. *Lockett, A. C.*—London, England
Finality of Treated Cases with Special Reference to European Conditions
16. *Lundstrom, Axel*—Stockholm, Sweden
Further Studies in the Apical Index
17. *Mershon, John B.*—Philadelphia, Pa.
The Lingual Arch
18. *Matthews, Cale*—Birmingham, England
The Complete Temporary Dentition at the Eruption of the First Permanent Molars. Its Importance in Diagnosis and Classification
19. *McCoy, James David*—Los Angeles, Calif.
Essential Technic in the Use of the Open Tube Appliance
20. *Pullen, H. A.*—Buffalo, N. Y.
(Subject to be announced)
21. *Rubbrecht, Oswald*—Ghent, Belgium
Title not yet received
22. *Simon, Paul*—Berlin, Germany
Ueber die Notwendigkeit einer Gnathostatischen Diagnostik in der Praktischen Orthodontie
23. *Schwarz, Rudolf*—Basel, Switzerland
Cephalometric Methods and Orthodontia
24. *Villain, George*—Paris, France
The Importance of Occlusion and Articulation in Dental Orthopedia
25. *Young, J. Lowe*—New York, New York
The Evolution, Construction and Manipulation of the Pin and Tube Appliance

Educational Clinics will be given in class form to cover the following subjects:

Plaster, impressions, models, etc.,
Band Technic
Lingual appliance construction
Labial appliance construction
Angle ribbon arch technic
Radiography
Photography
Engineering.

Case Reports: Over thirty, so arranged as to be on permanent display.

Table Clinics: Fifty, so arranged and tabulated that you can see practically any and all of the recent advances and developments in the mechanics of orthodontia.

Seventh International Dental Congress, Philadelphia, August 23-27, 1926

The Seventh International Dental Congress, which meets in Philadelphia, August 23 to 27 next, besides being a world conclave of dentists, will be notable for its exposition features directly related to dentistry.

The Congress is to be held in the city where an International Exposition of the arts, sciences, education, social and commercial progress is under way. The exposition will be of vast interest to the fifteen to twenty thousand dentists who will attend the Congress.

The dental profession will, however, have its own exposition in immediate conjunction with the Congress. Five important and large exhibits will be shown: (1) a dental scientific exhibit; (2) a dental public education and health exhibit; (3) a dental historical exhibit; (4) a Government exhibit, and (5) a commercial exhibit.

The historical and scientific exhibits will, it is predicted, be the most exhaustive displays illustrative of the advancement of dentistry that have ever been shown. The committee, headed by Dr. O. G. L. Lewis, Chairman, Philadelphia, has been active in gathering together the largest collection of material possible.

The Historical and Scientific Exhibits will comprise objects of unusual interest in every department of dentistry.

The section relating to the history of dentistry will be especially interesting. Many relics of the early practice of dentistry are to be exhibited.

Philadelphia is rich in historical association with the practice of dentistry. Here practiced LeMaire, the French surgeon and dentist who is considered the pioneer dental preceptor of America; Gardette, a pupil of LeMaire; Hudson, who was instrumental in the organization of dentistry as a profession; Koecker, pioneer dentist and author of works on dental practice and others. Here lived Charles Wilson Peale, the famous early American artist, who in his later years turned his attention to experiments which interested others in the development of porcelain teeth.

Military dental surgery will be an important part of the exhibition, which will be the profession's initial opportunity of viewing the results of the war experience of the dentists who served in field and camp. Dental science in Europe will contribute very extensively to this section of the exhibition.

The exhibits will be placed in buildings of the Commercial Museum, in whose vast assembly hall the deliberations of the Congress will be held. The Commercial Museum is a group of permanent exposition buildings, including one of the largest and best equipped convention halls in the country, owned and operated by the city of Philadelphia for display of export and import products.

The Commercial Museum is located in a part of the city within ten minutes' car ride of the heart of the city and immediately adjacent to the University of Pennsylvania, whose many buildings are amidst scenically pleasant surroundings. The Thomas W. Evans Institute and Museum of Dental Science and the University of Pennsylvania Dental School are among the buildings adjacent. The University student dormitories, which have been placed at the disposal of the visiting dentists, are immediately adjoining the Commercial Museum area. West Philadelphia Station on the main line of the Pennsylvania Railroad, bringing travelers from north, south and west, is within a five-minute ride of the convention hall.

Modern hotels, of large capacity, apartment houses and a vast residential district where rooming accommodations of all types can be obtained, are located in the West Philadelphia section of the city, adjacent to the convention building. In the neighborhood surrounding the University of Pennsylvania are hundreds of students' boarding houses and fraternity houses which will be at the disposal of the Dental Congress delegates.

The Commercial Museum is in an altogether different part of the city from that in which is located the Sesquicentennial International Exposition. The Sesquicentennial Exposition, held in celebration of the one hundred and fiftieth anniversary of the signing of the Declaration of Independence, will be in the southern part of Philadelphia, the site being also about ten minutes' ride from the City Hall, the central point of Philadelphia. The exposition grounds and the center of the city are easily accessible by fast surface and subway transit lines from the convention hall.

Many noted dentists are coming from abroad to attend the Congress. Word has been received from various European and South American countries that official representatives will attend the Congress.

It is confidently expected that this will be the largest assembly of dentists ever known in the history of the profession.

Annual Meeting, August 4 to 7, Houston, Texas

Three months ago tentative plans of the 1926 Houston meeting of our society and a boat trip to the Orthodontic Congress in New York, were outlined to you. Owing to the fact that as good accommodations and rates

have been offered by the Mallory Line sailing from Galveston, a slight change has been made.

The meeting of the Southwestern Society will begin at 9:00 A.M., August 4, Headquarters: Rice Hotel, Houston, and continue through August 7. On Saturday, August 8, we will leave Galveston 3 P.M., aboard S. S. San Jacinto for New York. All main deck cabins, reservations for eighty-six persons, have been retained until May 15. Over fifty have signified their positive intentions to join the party. In order to secure the best accommodations and to assist Dr. Arnold in arranging many details, it will be necessary for each one making the trip to forward a deposit of \$20.00. You may purchase round trip tickets over any railroad to Houston, Mallory line to New York, however, and return to your home over any railroad route you may desire. Your deposit will be returned to you in full on the sailing date. When forwarding remittance to me, please state the total rates for round trip quoted you by your local agent. We have secured a special rate, and, if it has not been quoted to you, it will give me ample time to secure a correction.

Reservations have been made for you in Houston and New York. Entertainment has been arranged for the Ladies. Our program, which will equal the past meetings, will soon be ready to mail to you. Arrangements are also being made to have such Southern Society members as desire to join our party at Key West (the only stop made between Galveston and New York).

A number of our Dental friends have inquired about the trip, and, as the date fits in nicely for those attending the Seventh International Dental Congress at Philadelphia, we will be glad to have as many as can make the trip with us. Kindly explain details to them and forward their names and required deposit to me. "First come, first served," as the number of reservations are limited. The round trip rate does not greatly exceed the round trip rail route, and is less, when meals and berth for five days on the boat are considered.

It may appear that these reservations are made greatly in advance. We assure you that such an arrangement has been found necessary. Should some condition arise previous to July which would prevent your making the trip, we assure you there will be little, if any, difficulty in filling your reservation and returning your deposit to you.

Best time of year for Boat Trip Entertainment—something doing for everyone every minute. A trip you cannot afford to miss.

A prompt reply helps us to help you; final completion of plans and program depends on you. Sixteen additional upper deck rooms, available at \$10.00 additional charge per person, rated round trip: from Kansas City \$126.77, Omaha \$141.11, Tulsa and Oklahoma City \$126.77, Waco \$123.26, Chicago \$137.00, Detroit \$136.76, Nashville and Montgomery via Houston \$129.00, Nashville and Montgomery via Key West \$95.00 or less, Amarillo \$141.00, Denver \$173.00, Dallas and Ft. Worth \$121.00. If by auto, boat rate from Galveston to New York \$63.00 per person, auto freight rate \$1.38 per hundred pounds.

IMPORTANT

You have previously been invited to present something for our program, and have signified your acceptance, so please send me the title of your table clinic or paper with your (deposit) remittance by return mail.

Fraternally yours,
P. G. Speneer,
Sec'y Southwestern Society Orthodontists.

Honorary Dinner, The W. D. Miller Club of Cleveland, Ohio

In appreciation of his contribution and inspiration to the Dental Profession, The W. D. Miller Club of Cleveland, on its tenth anniversary, will give a dinner in honor of Weston A. Price, D.D.S., M.S., F.A.C.D.

Speaker: Chas. H. Mayo, M.D., M.A., LL.D., F.A.C.S., F.R.C.S.

The dinner will be held during the meeting of the Northern Ohio Dental Association on June 9, 1926, at 6 P.M. Guests and ladies are invited. \$3.00 per plate.

Make reservations, accompanied by check, with Dr. S. F. M. Hirsch, 4900 Euclid Building, Cleveland, Ohio.

Notes of Interest

Dr. C. M. Musser announces the opening of offices in the Professional Building, Fairmont, West Virginia. Practice limited to orthodontia.

Dr. B. L. Hyams announces the removal of his offices to Suite 206, Old Birks Building, Montreal, Canada. Practice limited to orthodontia.

Dr. J. D. Odereal announces the removal of his office to Suite 332-333 Lafayette Arcade Building, 436 W. Lafayette Street, Tampa, Fla. Practice limited to orthodontia.

Dr. John C. McGuire announces the removal of his offices from 800 Davis Street to 636 Church Street, Evanston, Ill. Practice limited to orthodontia.

Dr. Harry L. Keel announces the removal of his offices from the second to the third floor of the Realty Building, Winston-Salem, N. C. Practice limited to orthodontia.

Dr. William A. Murray announces the opening of an office at 636 Church Street, Evanston, Ill. Practice limited to orthodontia.

Dr. James T. Walls announces the removal of his office from 626 Park Bldg., to 805 Stevens Bldg., Portland, Ore. Practice limited to orthodontia.